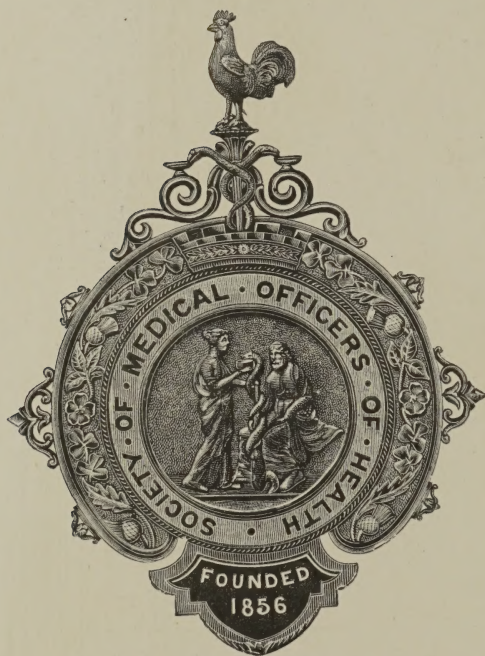
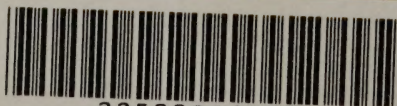


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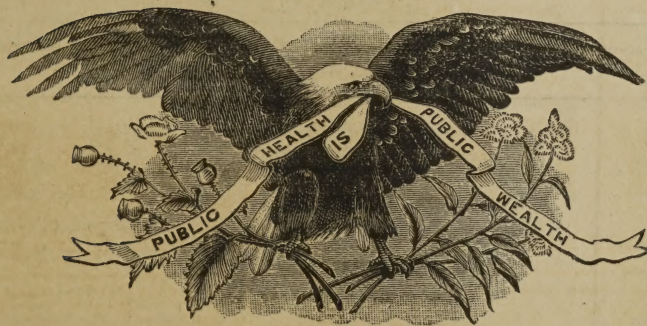
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THE SANITARIAN,

A MONTHLY MAGAZINE

DEVOTED TO THE

PRESERVATION OF HEALTH, MENTAL
AND PHYSICAL CULTURE.



VOLUME XXVII. JULY TO DECEMBER.

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THE SANITARIAN.

JULY, 1891.

NUMBER 260.

LONGEVITY.

A PAPER READ BEFORE THE ENGLEWOOD LITERARY SOCIETY,
BY SHEPPARD HOMANS.

WE read in the fifth chapter of Genesis : " And all the days that Adam lived were 930 years ; and he died." Also " All the days of Seth were 912 years ; and he died." The ages of five other descendants of Adam are then given, each of whom lived more than 900 years, and then we come to Methuselah, the oldest age on record. " And all the days of Methuselah were 969 years ; and he died."

After the flood the ages recorded of the patriarchs were much less. Abraham died at the age of 175, Isaac at 180, and Jacob at 147 ; and Sarah, whose age is the greatest recorded in the Bible of a female, died at 127.

In modern times we have the records, more or less authentic, of many persons who have attained extreme old age. Mr. James Easton, of Salisbury, England, published in 1799 a list containing the names of 1712 persons who had reached the age of 100 years and upward. In 1826, Mr. Charles Babbage collected 1750 similar cases. Haller cites two cases of extreme age which came under his own observation, one of 152, and the other of 169 years.

I select the following from a list prepared by the late Cornelius Walford, containing the names of 208 persons who died at or above the age of 120 years. Thomas Carn, Shoreditch, England, at the age of 207, in 1588. This case is said to be confirmed by the parish registers. If this be true, it is the most remarkable instance of longevity recorded since the

flood. 175 years, Louisa Truxo, a negress, Brazil, in 1780; 152 years, Thomas Parr, Shropshire, England, in 1635. In the *Petersburg Gazette*, a Russian paper published in 1812, the case is recorded of a man who died in the diocese of Ekateroios who attained an age between 200 and 205 years at death.

The age of Dr. Parr, as he was called, appears to be well authenticated. It has the testimony of Harvey, who dissected his body and found all the organs in a sound and healthful condition. Charles the First sent for Dr. Parr, who had become famous by reason of his extreme age. Dr. Parr went to court, where he was feasted, and, eating too much, died from a fit of indigestion. He might have lived many years longer—in fact, he may be said to have died from an accident.

There would then seem to be abundant evidence that, not only among the patriarchs who lived after the flood, but among those who lived in modern times also, instances are not wanting of deaths approaching the age of 200 years, which would seem to be about the extreme limit possible for man to attain.

Scientific research has demonstrated some remarkable physiological facts which bear upon the duration of human life. It is demonstrated that *species* never change. Their physiological characteristics are fixed and unalterable. Man at the present day has precisely the same formation, the same organs, the same type in fact, as may be found in mummies embalmed centuries before the Christian era. The fossil horse is the same as the living animal. Siberia was once peopled by elephants. These elephants have disappeared, but their fossil remains present precisely the same physiological characteristics as those of the living elephants. America was once peopled by mastodons. They have disappeared, but they have not left in their places other or different mastodons. The type of man, of the horse, of the elephant, and of every other animal, living or extinct, has remained unaltered by the revolutions and mutations of the globe.

Buffon, the celebrated naturalist, first enunciated the theory that the natural life of all animals bears a certain relation to the periods of their growth. This period is defined by the union of the bones with their *epiphyses*. When this union

takes place, the bones, and consequently the animals, cease to grow. M. Flourens, accepting this ingenious theory of Buffon, and having the advantage of later and more correct physiological knowledge, made a series of very interesting experiments by which to determine the length of time after birth when this union of the bones with the epiphyses takes place in different animals. He then found that the natural limit of life in all animals is about five times the period of growth.

Thus the union of bones and epiphyses and the consequent natural life of different animals is as follows :

Man	grows 20 years.	Natural life, 100 years.
Camel	" 8 "	" " 40 "
Horse	" 5 "	" " 25 "
Ox	" 4 "	" " 20 "
Lion	" 4 "	" " 20 "
Dog	" 2 "	" " 10 "
Cat	" 1½ "	" " 7½ "
Hare	" 1 "	" " 5 "

Buffon states : " The man who does not die of accident or disease lives everywhere to 90 or 100 years of age." Hufeland says : " Nearly all those deaths which take place before the hundredth year are brought on artificially—that is to say, by disease or accident." Dr. Farr in the Sixteenth Annual Report of the Registrar General of England says : " The natural term of human life appears to be 100 years." Finally, the prophet Isaiah says, 65 : 20, " There shall no more thence be an infant of days, nor an old man that hath not filled his days, for the child shall die an hundred years old."

The extreme limit of life appears to be about twice the natural limit or term. Thus instances have occurred of man living to 200 years, or very nearly ; and Buffon relates, with much minuteness, the history of a horse that lived 50 years, and died February 24th, 1774.

How are we to account for the ages recorded in Genesis of Adam, his sons, and Methuselah ? We cannot disregard the teachings of science, nor need we doubt the statement in Holy Writ. Each has Divine authority. By what theory can we reconcile the two ? Simply that the year, or unit of time, among the early patriarchs differed from that adopted since

the Deluge, which has been twelve calendar months. Hensler, a high authority, shows the strong probability that the year, till the time of Abraham, consisted of three months only, and that not until the time of Joseph was it extended to twelve months. "This assertion," says Hufeland, a still higher authority, "is to a certain degree confirmed by some of the Eastern nations who still reckon only three months to the year," and besides it would be altogether inexplicable why the life of man should have been shortened three fourths immediately after the flood. Moreover, the recorded ages when the early patriarchs married was about four times the usual age. Again, with the period of Abraham, we find mention of a duration of life which can still be attained, and which no longer appears extraordinary, especially when we consider the temperate manner in which the patriarchs lived. We think, therefore, that Hufeland has arrived at a correct conclusion when he says that "man can still attain to the same age as ever."

By the census of 1851, there were living in England and Wales 319 persons (111 males and 208 females) whose reputed ages ranged from 100 to 119 years.

At the instance of Mr. James Thom, a parliamentary commission was appointed to visit each of these alleged centenarians in order to examine the evidences upon which their reputed ages were based, as well as to inquire into the particulars as to their habits, modes of life, etc.

A singular instance of the thoroughness with which Mr. Thom and his commission conducted their inquiries was afforded in the case of a Greenwich pensioner who had served in the Royal Navy, and whose age was reputed to be 107 years. This sailor, whose name we will assume to have been John Smith, asserted that he was the son of Mary and Thomas Smith, and that the date of the marriage of his parents, as well as the date of his own birth and christening, could be found in the parish registers, of his native place. Mr. Thom examined these parish registers, and found the several dates agreed with the old sailor's statements, and there appears to have been no doubt that he was the son of the Thomas and Mary Smith, as claimed. Mr. Thom, however, was not entirely satisfied. A further examination of the same registers

showed that a year or two after the recorded birth of John Smith, son of Thomas and Mary Smith, the child died and was buried in the parish churchyard. A year or two subsequently another son of the same Thomas and Mary was born and was christened John. This John afterward died and was buried, and a further search showed the record of the birth and christening of a third John, son of Thomas and Mary Smith, and this was undoubtedly the old sailor himself, who was thus proved to be only 97 years, instead of 107, as claimed.

Mr. Thom and his commission visited every one or nearly every one of the alleged centenarians, and examined the evidences of age, mode of life, etc., in each case. It is remarkable that the evidences as to actual age were defective, or entirely wanting, and also that great diversities appeared as to modes of living, diet, etc. Some of the oldest used spirits and tobacco—others abstained entirely. In two particulars they were all alike—in the habit of early rising and in the avoidance of undue excitements or excesses of any character.

This same Mr. Thom investigated the case of a Captain Lahrbush who created quite a sensation in New York, where he died some twenty years ago, at the alleged age of 111 years. This Captain Lahrbush claimed that he was an officer in a certain Scotch Regiment, British Army, and was present with his regiment at the treaty of Tilsit, which was signed in 1807. Mr. Thom first proved that the Scotch Regiment named was not on the Continent in 1807. He then searched the records of the British Army, and found that the only officer named Lahrbush who had been entered on its rolls was cashiered for *youthful* indiscretions in 1818. A full discussion of these points was published in the *New York Tribune*.

WHAT IS LIFE ?

There are some things which the mind of man cannot compass. Life, death, annihilation, eternity, space, are all beyond our comprehension. At the utmost we can only grasp some of their *attributes*. Of their essence we must always remain in ignorance.

One attribute of life is that it does not commence with each new individual or each new being. Life commences only once for each new species. Reckoning from the first created

pair of each species, life never begins again, it is continued. Life is transmitted in each species by parents to their offspring, and with life certain unalterable, unchanging characteristics which belong exclusively to that species, which are never found in any other species. Species remain with unaltered organs, formation, etc., and species disappear, but their peculiar physiological characteristics never reappear in any other animals or beings.

Lord Bacon compares life to a flame. "Man is constantly consuming and being consumed." Hufeland says: "Destructive and creative powers are engaged, with a never-ceasing activity, in a continuous struggle within us; and every moment of our existence is a singular mixture of annihilation and new creation. As long as the vital power retains its freshness and energy, the living plastic power will have the superiority and the body will increase and approach nearer to perfection, and at last, the vital power being lessened, the consumption will begin to exceed the renovation, and decay, degeneration, and in the end total dissolution will unavoidably follow. The life of man has been divided into two nearly equal parts, one of increase, the other of decrease. Each of these parts is divided into two others—hence the four ages, infancy, youth, manhood, and old age. Lastly, each of these four ages is sub-divided into two. A first infancy from birth to age 10. A second from 10 to 20; this is adolescence. A first youth from 20 to 30; a second from 30 to 40. A first manhood from 40 to 55; a second from 55 to 70. A first old age from 70 to 85; a second from 85 to 100. The first infancy is the period of dentition. The second infancy ends at 20, when the bones cease to grow and are united with their epiphyses. Youth is prolonged to 40 because it is only about that age when the body has attained its greatest strength—it is the *virile* epoch of life. The first manhood from 40 to 55 is the period of invigoration, which continues, however, until 65 or 70. At 70 old age begins. This is the period when the forces in reserve are drawn upon. When there can be little if any recuperation, when man lives upon his *reserve*. The unknown *force* of life diminishes more and more as age advances. The duration of life in any being will be proportionate to the innate quantity of vital power, the greater or less

firmness of its organs, the speedier or slower consumption, and the perfect or imperfect restoration.

Long life has at all times been the chief desire, the principal object of, mankind. How can it be secured? How can the flame be supplied with fuel? These are questions which have always engaged the attention of the deepest thinkers. Perhaps the most interesting and instructive example of the ability to prolong life and preserve health is given in the writings of a wise old man who owed his century of existence to a strict adherence to the principles of sobriety and moderation.

Luigi Cornaro was born at Venice about the year 1465, though the exact date of his birth is variously given. He died, April 26th, 1566, at Padua. He belonged to one of the old families in the city. One of the Cornari, Marco, who died just a hundred years before Luigi's birth, was Doge; and three other bearers of the same name attained the same distinction after his death. He began life with a bad constitution, and a long course of excesses had, by the time he reached the age of 35, reduced him to a state of extreme misery. For four or five years he remained in constant bodily and mental suffering. Gout began to lay hold of him; he was tormented by pains in the stomach and by perpetual feverishness and thirst. His physicians pointed out to him that his chronic ailments must have their cause in his habitually disordered life, and urged him again and again to change it. He was long convinced of the truth of what they said to him before putting their advice into practice. For a while he pretended to follow it, still eating and drinking as before, and concealed the fact from his doctors—"as all patients do," he adds with some humor.

At last he found the strength of will to adhere strictly to the diet and mode of life prescribed for him; and at the end of a year he found himself, instead of a broken-down, hopeless invalid, unfit for either work or enjoyment, a healthy and singularly active and happy man. He then came to the natural conclusion that the regimen which had overcome the effects of excesses and repaired the natural weakness of his constitution must be the one to keep him permanently in good health; and from that time onward, during the sixty

years which remained to him of life, he never, except in the rarest instances, and then to his hurt, swerved from it. He more than completed his eightieth year before he set himself down to write his own experiences for the benefit of others. During forty years he had lived a life of almost unbroken health and happiness—a life which contrasted as much with that which he had himself led in his earlier days as with that which he saw commonly lived by others around him. One consideration weighed upon him especially—namely, the value of the later as compared with the earlier years of life. Many men, he argued, by the time they had acquired the knowledge, judgment, and experience which qualified them to be useful in the world, are physically, in consequence of their careless living, worn out. Men who might live, in full possession of all their faculties, to the age of ninety or a hundred, pass away at the age of fifty or sixty. Many who, as he puts it, might “make the world beautiful,” are cut off untimely through the same cause. This feeling, joined to the amiable vanity of a happy and prosperous old age, prompted him to lay his experiences before the world.

Cornaro’s regimen—which consisted of eggs, soup, bread, pancakes, and such like food, with wine—was, as he tells us, intended for himself alone. All people should live temperately, but the temperance of one man is the excess of another. Cornaro’s method is the simple one, that each man should find out for himself what is the suitable quantity of food and drink for himself, and live accordingly. The charm of Cornaro’s narrative consists in the garrulous naïvete with which he sets forth his simple creed and practice. Italy, he says, was suffering from three great evils—first, from flattery and ceremonies; secondly, from the effects of Lutheran doctrines; thirdly, from debauchery. These three evils, or rather “cruel monsters of human life,” have destroyed respectively social sincerity; secondly, the religion of the soul; thirdly, the health of the body. The first two plagues he leaves to be dealt with by some “gentili-spiriti,” who will banish them from the world; the third he undertakes to extirpate himself, being convinced that Italy, before his death, will return to her former “fair and holy manners.” To this end he gives his own practice as an example to be

followed—at least in its aim and spirit. His daily allowance of food was three rolls, the yolk of an egg, with meat and soup—the whole weighing twelve ounces ; his daily allowance of wine was fourteen ounces. On one occasion, after he had slightly increased the quantities, he became in a few days “cholerick and melancholy,” and soon fell into a violent fever, from which he only recovered by returning to his former regimen. He never ate or drank to the extent of his appetite ; avoided extremes of heat and cold ; was careful to have sufficient sleep.

To keep clear of grief, melancholy, hatred, and other perturbations of the mind was also an essential part of his system ; though temperance in eating and drinking will do much to counteract mental troubles, as well as to neutralize the effects of bodily hardships. Once when powerful enemies brought a suit against him, he kept his equanimity and won his case in the end ; while his brother, who had led an irregular life, died of anxiety while the case was still going on. If men were but temperate as he was himself, they would live to be 100 years old. He himself intended to do so, and to die at last, not of disease, but of “*pura risoluzione*.” If he had had a good constitution to start with, he would have reached 120 years instead of only 100. He did, in fact, die at the age of 100, if he did not surpass it.

Cornaro gives one curious reason for desiring long life. “If one is a cardinal he may become pope by age. If of importance to the republic he may become chief of it.”

Cornaro finishes his first “Discourse” thus :

“Such is divine sobriety, friend of nature, daughter of reason, sister of virtue, companion of noble, modest, temperate, regular life, and strict in all its actions. It is the root of life, of health, of joy, of address, of skill, and of every action worthy of a noble mind. Laws, divine and human, favor it ; irregularities, and the perils attendant upon them, fly before it, as the clouds before the sun. Its beauty attracts every noble heart ; its practice ensures to all a happy and lasting existence ; we know it to be the amiable and benign guardian of life, be it rich or poor ; it leads the rich to observe moderation, the poor, economy ; the young man to a firmer and surer hope of life ; it protects the old man from

death. Sobriety purifies the feelings, quickens the faculties, cheers the mind, strengthens the memory. The soul, almost freed by it from its earthly load, enjoys a larger liberty."

At 95, the closing words of his forth and last "Discourse" still display his native regard for *length of days*.

"I conclude by declaring that great age may be so useful and agreeable to men, that I believe that I should have been wanting in charity if I had not taken pains to point out by what means they may prolong their days, and as each can boast of happiness of his own, I shall not cease to cry to them, 'Live, live long.'"

From the foregoing we may see, if we wish long life and good health, how important it is to observe the principles of sobriety and moderation. Not only moderation in eating and drinking, but moderation in the undue excitements of passion and feeling. There is one disease, unknown in the scientific classification by physicians, which in the present day kills more patients than any other. That disease is *worry*. The patriarchs attained extreme old age, because of their simple, pastoral life, with avoidance of undue excitements or worry. There is no case on record of a man with violent temper, or who was affected with the disease, worry, who attained extreme age.

In addition to moderation and sobriety of living, and of the due observance of sanitary laws, I would add another very important factor, and that is the necessity of moderate and regular exercise.

A recent writer, Edwin Checkley, in his most interesting and instructive work, "A Natural Method of Physical Training," states that not one person out of a hundred knows how to *breathe* properly. He urges the inflation of the chest and the closing of the mouth when breathing, which should be drawn at regular and long intervals. I well remember when a young man seeing Indian papooses whose mouths were kept closed by bandages which their mothers had fastened under their chins and around their heads. I did not then know the object. Checkley has explained it. It is to teach the children how to breathe.

It is wonderful how exhilarating are the effects of following Checkley's simple instructions, and how beneficial, as I can attest from personal experience.

Checkley lays down an admirable course of physical training and exercise without apparatus, and urges that each set of muscles should be duly strengthened and made supple. He is opposed to the usual gymnastic exercises with apparatus, as being costly, unnecessary, and tending to develop some sets of muscles unduly, while other sets are neglected. Athletes are generally developed abnormally, and by violent exercises run great risk of injuring the heart. Athletes rarely attain old age.

Here is a portrait by Hufeland of a man destined to long life.

“ He has a proper and well-proportioned stature, without, however, being too tall. He is rather of the middle size, and somewhat thick-set. His complexion is not too florid. At any rate, too much ruddiness in youth is seldom a sign of longevity. His hair approaches rather to the fair than the black ; his skin is strong, but not rough. *His head is not too big* ; he has large veins at the extremities, and his shoulders are rather round than flat. His neck is not too long ; his abdomen does not project ; and his hands are large, but not too deeply cleft. His foot is rather thick than long ; and his legs are firm and round. He has also a broad arched chest ; a strong voice, and the faculty of retaining his breath for a long time without difficulty. In general, there is a complete harmony in all his parts. His senses are good but not too delicate ; his pulse is slow and regular. *His stomach is excellent*, his appetite good, and his digestion easy. The joys of the table are to him of importance ; they tune his mind to serenity, and his soul partakes in the pleasure which they communicate. He does not eat merely for the sake of eating ; but each meal is an hour of daily festivity ; a kind of delight, attended with this advantage with regard to others, and it does not make him poorer, but richer. *He eats slowly*, and has not too much thirst. Too great thirst is always a sign of rapid self-consumption. In general, he is serene, loquacious, active, susceptible of joy, love, and hope, but insensible to the impressions of hatred, anger, and avarice. His passions never become too violent or destructive. If he ever gives way to anger he experiences rather an useful glow of warmth, an artificial and gentle fever, without an overflowing of the bile. He is fond also of enjoyment, particularly calm medi-

tation and agreeable speculation ; is an optimist, a friend to nature and domestic felicity, and has no thirst after honor or riches ; and banishes all thoughts of to-morrow."

I would add that in my opinion every person, at least every one that is not afflicted with organic trouble, or who has not neglected too long the observance of the laws of nature, has within himself the power to prolong his own existence, as well as to improve and to secure his own good health. In life insurance we find that the best risks are not the most robust men, not the athletes, but the men who, without organic trouble or inherited tendencies to disease, are yet obliged to take care of themselves—men who, like Cornaro, live with sobriety.

I close this paper with a quotation from Addison, who in his "Vision of Mirza," must have had in mind a mortality table.

"The bridge thou seest, said he, is *Human Life* ; consider it attentively. Upon a more leisurely survey of it, I found that it consisted of *three-score and ten entire arches*, with several broken arches, which, added to those that were entire, made up the number *about an hundred*. As I was counting the arches, the Genius told me that this bridge consisted at first of a *thousand arches* ; but that a great flood swept away the rest, and left the bridge in the ruinous condition I now beheld it. But tell me further, said he, what thou discoverest on it. I see multitudes of people passing over it, said I, and a black cloud hanging on each end of it. As I looked more attentively, I saw several of the passengers dropping through the bridge into the great tide that flowed underneath it ; and upon further examination perceived that there were innumerable trap-doors that lay concealed in the bridge, which the passengers no sooner trod upon but they fell through them into the tide, and immediately disappeared. These hidden pit-falls were set very thick at the entrance of the bridge, so that throngs of people no sooner break through the cloud but many of them fall into them. They grew *thinner toward the middle*, but multiplied and laid closer together toward the end of the arches that were entire. There were, indeed, some persons, but their number was very small, that continued a kind of hobbling march of the broken arches, but fell through one after another, being quite tired and spent with so long a walk."—*The Insurance Monitor*.

CORROSIVE SUBLIMATE AS A DISINFECTANT.

DR. A. C. ABBOT (Johns Hopkins Hospital Bulletin, April, 1891) has published the results of his careful and thorough investigation of the destructive power of solutions of corrosive sublimate upon the most common of the micro-organisms of suppuration, the *staphylococcus pyogenes aureus*. From these investigations he comes to the following conclusions :

Under the most favorable conditions a given amount of sublimate has the property of rendering inert only a certain number of individual organisms. That is to say, the process is a definite chemical one, taking place between the protoplasm of the individual bacteria and the sublimate in the solution. The disinfecting activity of the sublimate against organisms is profoundly influenced by the proportion of albuminous material contained in the medium in which the bacteria are present. The relation between the golden pyogenic staphylococci and sublimate is not a constant one, organisms from different sources and of different ages behaving differently when exposed to the same amount of the disinfectant, for the same length of time. The organisms which survive the exposure to the sublimate may experience a temporary attenuation. This attenuation, however, may be caused to disappear by successive cultivation in normal media. By the method employed in these experiments it is possible to select from a culture the most resistant forms in that culture. Many of the results of previous experimenters, who have assigned to corrosive sublimate more powerful disinfectant properties against the *staphylococcus pyogenes aureus* in cultures than the observations reported in this paper indicate, are attributable to the neglect of certain precautions now recognized as essential to the proper conduct of such experiments.

In the light of these experiments and those of the experimenters quoted in the paper, it is plain that for use in surgical practice the solutions of corrosive sublimate do not possess all of the advantages hitherto attributed to them.

To the employment of sublimate solutions upon wound-

surfaces, it is plain that there exist at least two serious objections. First, the albumen of the tissues and fluids of the body tends to diminish the strength of, or indeed renders entirely inert, the solution employed. And second, the integrity of the tissues is materially injured by the application of solutions of this salt.

The first objection cannot be met with certainty, for the surgeon possesses no means by which he can determine the amount of albuminous material with which his solutions are to come in contact, and in any case this large amount of albuminous material is an almost insuperable obstacle to complete disinfection with sublimate. He is, therefore, never in a position to say, *a priori*, that his efforts at disinfection of the wound are or are not successful.

The second objection is equally serious. During the past two years we have had sufficient evidence to lead us to believe that the normal tissues and fluids of the body possess the power of rendering inert many kinds of organisms which may have gained access to them. This function is therefore diminished, or, indeed, may be quite destroyed, by any agent which brings about alterations in the constitution of these tissues. We know that just such changes as those to which we refer are known to follow the application of sublimate solutions. It is plain, then, if we bring about in these tissues a condition of superficial necrosis, the condition following upon the application of sublimate, they are much less able to resist the inroads of infectious organisms than they would have been had they been left in their natural condition.

As a disinfectant, in the strict sense of the word, there are, perhaps, few substances which possess the property in a higher degree than does corrosive sublimate, but at the same time there is nothing which is employed for this purpose that requires greater care in its manipulation in order to obtain its best results than does this salt. Its action is influenced by a number of conditions which in practical application it is difficult if not quite impossible to control.

For these reasons we seem hardly justified in continuing to give to it the first place in the list of substances which may be employed practically for the purpose of rendering harmless materials containing the germs of infectious maladies.

6

TRANSACTIONS OF THE SEVENTH ANNUAL
MEETING OF THE AMERICAN CLIMATOLOGI-
CAL ASSOCIATION, HELD AT DENVER, COL.,
SEPTEMBER, 1890. (Continued from Vol. XXVI.,
page 524.)

THE DETRIMENTAL EFFECTS OF OVER-EXER- TION IN PULMONARY PHTHISIS.

By KARL VON RUCK, M.D., Asheville, N. C.

INASMUCH as no material benefit can be expected from direct medication in the treatment of pulmonary phthisis, and inasmuch as success must almost entirely depend upon management, which may be called a hygienic and prophylactic therapeutics, I have in pursuance of the latter endeavored to study as closely as possible, to what extent it is really practical to influence the course of the disease.

In so doing, I have had the advantage of being able to give my entire attention to the treatment of phthisis for some years past, during which a large number of cases have come under my care, both in private practice and in my special institution.

By the close association with patients, it has been possible to observe the conditions under which they appeared to improve and recover, and also the apparent causes which led to reverses and relapses, some of which I had formerly failed to appreciate to their full extent.

It is now my purpose to point out in this communication one of the causes which I have found to exert the greatest influence upon the course of the disease, not only as an obstacle to favorable progress, but frequently leading to reverses not again recovered from.

I refer to physical and mental over-exertions and the thereby induced heart-fatigue.

Having found my patients so uniformly inclined to carry these beyond the limits of benefit and safety, and having seen more or less serious results to follow such indiscretions most constantly, I am fully convinced that if this cause alone could

be eliminated, the cases of improvement and recovery would be increased in number more than an hundred per cent, and I ascribe the better results obtained in my institution, as compared with those in private practice, in no small measure to the control in this matter, which I there am able to exercise.

The cause for these constant indiscretions on the part of phthysical patients is apparent, and depends upon the fact that the more intelligent understand very well how little they really have to hope from the administration of drugs for the cure of their disease, and that they place their only hope in the out-of-door life and exercise, which has been recommended most urgently by their trusted medical advisers, and so anxiously do they cling to this supposed only chance, that any attempted limitation of it is looked upon by them as a doubtful measure and with apprehension.

Certainly, so long as they are able to follow a contrary course they are most unwilling to dispense, even only in part, with what is to restore to them their health.

They can see no harm in taking in, as much as possible, of the air which will heal their lungs, by forced respiration carried on purposely or produced by violent exercise, and the latter they feel sure will restore their former strength. This belief on the part of patients is, however, largely due to medical advice, in which out-of-door life is, as a rule, conjoined with exercise, without proper caution as to the latter. Indeed, I know of eminent physicians having advised as much as possible of both for patients who should at the time have kept their beds.

It is truly pitiful to see such patients literally drag themselves about, exhausting what little strength and recuperative power they may still possess; and more so yet, to see how, under the mistaken association of exercise with the necessary out-of-door life, their wasting becomes more evident from day to day, their steps less secure, their frames more stooping, their stopping "to catch breath" more frequent, and the hectic flush more distinct upon their sunken cheeks, until finally, from utter exhaustion or from resulting relapses and complications, they are obliged to keep to their houses and rooms. But even here they resort to indoor gymnastics—swinging dumb-bells or Indian clubs, or box against an

imaginary foe in the form of a suspended and inflated rubber air-bag, or other contrivance calculated to offer resistance to their self-exhausting blows. Such sights are not uncommon in advanced cases, and the picture is only less painful in cases of the early stage because there is still a relative appearance of well-being, but so long as they tax their strength to the utmost in violent exertion, the advanced stage is reached surely and steadily, although the pace may appear less rapid.

To illustrate the injurious consequences of over-exertion, I append notes from my case books of a limited number, some from my institution and others from private practice.

Case 1. Gentleman in early stage of pulmonary tuberculosis : had been free from fever for over five weeks, during which the pulse rate had not been recorded above eighty-eight, he had gained eleven pounds in flesh, and his general condition, as well as the local state of his lungs, were highly satisfactory. He had thus arrived at a period where, by reason of consciousness of returning health, the tendency to over-exertion is particularly manifest. Contrary to his general directions, he exceeded the amount of exercise allowed him, by a walk of over six miles, returning much fatigued. He had no appetite for his next meal, and the record for the evening shows, temperature one hundred, pulse one hundred and twenty, respirations twenty-eight. It was a week before his previous condition was restored, with the loss of five pounds in weight, which it took him a month to regain.

Case 2. A young lady in more advanced stage of pulmonary tuberculosis : active symptoms had been absent for four months, during which there was no fever, pulse rate eighty to ninety-six, respirations twenty-two to twenty-four, appetite good, slight cough, and scant expectoration early in the morning, few bacilli were still present in sputum. Her body weight had reached one hundred and thirty pounds, which was more than she had ever weighed. At this time she ascended a neighboring mountain, and returned hurriedly on account of some fright. She arrived completely tired out, panting for breath, and with a pulse which could hardly be counted—about one hundred and forty. Within an hour she expectorated several mouthfuls of clear blood, the pulse continued between one hundred and twelve and one hundred and

twenty for several weeks, on the third day febrile symptoms with loss of appetite appeared, during the month she lost eleven pounds of flesh, and did not regain her previous condition until three months thereafter.

Case 3. Married lady ; pulmonary tuberculosis : had just passed through stage of softening in right upper lobe, but was now improving in all her symptoms, being, however, still forbidden all active exercise, for which massage was substituted. Believing herself strong enough, and desirous of a change, she walked down-stairs and upon the piazza and returned to her room within half an hour, when her temperature had risen two and a half degrees Fahrenheit and her pulse rate increased thirty beats per minute, above any record for three weeks previous. She had no appetite for several days, lost two pounds of flesh that week, whereas the week previous she had shown a gain of three pounds.

Case 4. Same patient : about two months later she had made much further improvement, fever was now practically absent, pulse one hundred, respirations eighteen, had been allowed short carriage rides with apparent benefit. Limited to half an hour, on the present occasion she was out two and one half hours, and also stopped in town for some shopping. She returned so tired that she had to be carried to her room, chill occurred twenty minutes later, high fever and loss of appetite set in, she relapsed in every way and never again reached the improvement at which she had arrived before this last ride.

Case 5. Gentleman in advanced stage of pulmonary tuberculosis : a large, suppurating cavity in right upper lobe, history of repeated hemorrhages and a severe one, just recovered from before his arrival. He resided a short time in my institution, during which he gained in flesh, fever and pulse rate had become less with almost every day, and his appetite improved correspondingly. Desirous of getting cheaper accommodations, he went to a boarding-house about one mile distant, and returned thereafter several times for advice, always on foot, and each time his pulse rate was very rapid. In ten days he lost all he had gained, and he again returned to my house. Improvement occurred once more, so much that he believed himself much stronger in every way, and per-

sisted in ascending the mountain in the rear, claiming that he enjoyed it and that it did not hurt him in the least. Upon every occasion, however, I found that his pulse rate increased from thirty to forty beats and continued so for a number of hours later. I was fearful of return of hemorrhage, which I held up to him as a likely occurrence, begging him to desist ; but although he promised, he took another trip without my knowledge. Returning, he died of a violent hemorrhage a few minutes after he had reached my house, and although at his side almost instantly, there was no time to render him any material aid.

Case 6. Gentleman with tubercular phthisis : entire right lung involved and circumscribed breaking down in upper lobe ; he made a moderate sized cavity in the course of a month, during which he had kept his room most of the time. Although he had much fever and little appetite, he maintained his weight through this period. Improving thereafter rapidly, he was kept out-of-doors almost continuously, but his exercise was limited to repeated short walks upon the level grounds and to short carriage rides. He, however, soon began to extend his walks to distances of a mile or two, which were followed each time by a slight return of fever and increase in cough and expectoration, and as soon as he had recovered from one reverse he was sure to produce another by his indomitable desire to take long walks, and no amount of remonstrance seemed to bring him to his senses, until I informed him that unless he desisted our relation as physician and patient would cease.

At this time he had lost thirteen pounds of flesh, had regular evening fever, with continuously rapid pulse and profuse expectoration.

Henceforth we had no further trouble, and as by returning improvement he recognized his previous folly, he became not only a most exemplary patient, but grew actually timid, so that I had frequently occasion to urge him to increase physical exertion.

Case 7. Young lady in beginning of advanced stage of pulmonary tuberculosis : with a tendency to get into trouble, if there was an opportunity ever so remote, had had many slight relapses from mental and physical over-exertion, but after

many trials permanent arrestment after a year's residence in my institution was finally obtained.

Her general health was good and local symptoms were absent, but her endurance seemed still to have a limit. As she was about to be discharged I gave my consent to horseback exercise, for which she had long besought me; this time rather to make a test, as she was sure to take it up upon her return home. No harm resulted until she exceeded the limit of one hour and stayed out all the forenoon in company with another patient. From what I could learn the ride was rather a wild chase than one for health; it resulted in immediate loss of appetite sense of fatigue and malaise, increased pulse rate for several days, during which she lost several pounds of flesh, menstruation occurred a week in advance, and altogether it delayed her discharge for nearly a month.

Case 8. Young lady in early stage of pulmonary tuberculosis: she accompanied the patient whose imprudence I have just related.

Being an inexperienced rider, she was limited to half an hour, and several such short rides taken previously had appeared beneficial. At this time she was gaining in every respect. She did not come off as easily as her companion. On her return she seemed utterly exhausted, active symptoms returned, which confined her to her room for several weeks, physical examination showed extension of the disease; she lost six pounds of flesh, but made up her relapse during the month following, when she returned home for the summer.

Case 9. Gentleman with pulmonary tuberculosis past the early stage: had resided in my institution several weeks and had followed advice conscientiously with so much benefit, that he was evidently improving. One morning he retired to his room after breakfast and engaged in letter-writing until noon, by which time he reached a temperature of 102 and a pulse rate of 130; he had no appetite for his dinner and for several meals thereafter, and it took him a week before he felt well as before, during which time he lost two pounds in flesh.

During the week before he relapsed his temperature had only once reached 100, his highest pulse rate 96, his appetite had been good, and his weight had increased three pounds.

He told me on another occasion that he had not believed the letter-writing to have been the cause of his relapse, and therefore tried it once more with almost identical results, and I found, in his case, that even a game of cards or prolonged animated conversation had a similar although more transient effect.

Case 10. (From private practice.) Lady with non-tubercular phthisis in somewhat advanced stage. She believed in plenty of out-of-door life and exercise, and her home physician had so ordered. Under regular horseback exercise on every fine day (and we have on an average of about twenty-five in each month) or long walks instead, she had lost twenty-two pounds in weight in the three months she had been in Asheville. Her temperature at the time she consulted me reached one hundred and three and over, her pulse was one hundred and thirty, cough, expectoration, and night sweats kept her restless at night, and she was very much discouraged. By my advice she restricted her physical exercise to short walks and carriage rides, and beyond some treatment for nasal stenosis and pharyngeal catarrh, and the regulation of diet, no other change was made in the management of her case. After a month she had gained eight pounds, her temperature and pulse rate were much less, and she expressed herself as feeling better in every way. Three months later she returned home greatly improved, having made a gain of twenty-seven pounds in flesh from the time she came under my care, active symptoms had disappeared in the affected lung, and there was an almost entire subsidence of fever, cough, and expectoration.

Case 11. (From private practice.) Lady with tubercular infiltration of right upper lobe and moderate deposit in left ary-epiglottic fold. She consulted me on account of growing constantly weaker and having much fever, and desired to know of a more suitable climate for her case. I found she lived in a boarding-house a mile out of the city, and to get proper exercise and to keep up her strength, she walked that distance once and often twice a day. I pointed out her error, and persuaded her to place herself under more favorable conditions. She entered my institution soon thereafter, where her larynx received some attention and her exercise and diet

were properly regulated. Before she left Asheville, two months later, she had made remarkable improvement, which had begun immediately upon her admission. She could now walk several miles without injury, had gained her former weight, was free from fever, and, as she expressed it, "felt well enough to go home." Bacilli had been absent in the slight expectoration at the last two examinations made.

Case 12. (From private practice.) Gentleman with pulmonary tuberculosis: entire right lung involved and slight excavation in upper lobe. Called upon me on account of continuous loss of flesh and strength, fever, and almost daily bloody expectoration.

He had lost fourteen pounds in the six weeks since he had left home, had high temperatures and rapid pulse, frequently vomited his food on account of severe cough, and was very much exhausted. His physician had advised him to go to Asheville, let doctors alone, get a horse and ride through the country, if he wanted to save his life!!! He had followed this advice, and was unwilling to give it up, and although he now restricted his exercise somewhat, he was worse after a month, during which he consulted me several times. He had lost six more pounds of flesh, and an acute pleurisy now intervening, laid him up and stopped his folly! After partial recovery he confessed himself ready and willing to do whatever I thought best for him, and he kept his word. Neither had we any further trouble; he improved rapidly and returned home with his cavity cicatrized, all rales had disappeared, he had gained nine pounds in flesh, fever, cough, and expectoration were improved, he was able to walk a mile or two without fatigue or injury, and this without ever again having mounted a horse.

I could now go on and relate many such cases, more or less striking, and all showing the same relation of over-exertion to unfavorable progress. In my practice, I am now most unwilling to abandon inquiry for this indiscretion, when relapses occur that are not otherwise referable. Any physician who cares to can make similar observations for himself, to do which, however, requires the careful keeping of records of frequent observations of temperature, pulse rate, respiration, cough, and expectoration, conditions of the digestive organs,

body weight, etc., and also of the local findings of frequently repeated physical examinations, but which, unfortunately, in private practice seem seldom possible, on account of the amount of professional attendance required which few practitioners are able to give and fewer patients would be able to appreciate.

I have frequently been asked why it is that over-exertion is so particularly harmful in the chronic affections of the respiratory organs, not only by patients, but also by professional friends and physicians, who were my patients, some of them maintaining that sufferers from other chronic diseases are not liable to reverses from similar causes. Less close observers, or those who had perhaps given the matter little attention, have even claimed this for phthisical patients, and indeed the relation is not always so strikingly apparent as to invariably attract our attention, especially in private practice, where we see our patients infrequently, and, as a rule, are only called or consulted after the relapse and when our inquiry (if we make it) elicits only the patients' views in the matter.

Frequently, too, we concern ourselves most with the present condition and its relief; especially in a busy practice we are apt to pay less attention to inquiries into preventable causes than we really should. At any rate, I freely confess that before I was interested in this work as I now am, I allowed myself to be satisfied with the explanation that a patient had taken cold, or with the supposed natural downward tendency of the disease, and it seems strange to me now that the great importance of this matter escaped my attention for so many years of my earlier practice. I know now that relapses from taking cold occur infrequently, and the supposed downward tendency does in fact exist in a diminutive fraction of cases only, in which the disease runs an unusually acute course, but that, on the contrary, there is a strong tendency to repair, improvement and recovery in the great majority of cases, even in such as are well advanced in the disease.

If phthisical patients are, however, more liable to reverses from over-exertion than others (and closer observation may show such liability to exist in sufferers from other affections also, and it is known to exist in certain diseases of the circulatory organs), the accounting seems not so difficult, for we

find a good explanation in the effect upon the right side of the heart, and the lesser circulation of any exercise which increases the heart action and causes a greater demand for aerated blood by the tissues through the systemic circulation.

In the presence of obstruction to a free blood current through the lungs, by reason of impaired expansion, inflammatory and tubercular deposits, connective-tissue proliferation, cicatrization and retraction, accumulated secretions and other causes for pressure upon the pulmonary vessels, the right heart and large venous channels become thereby overloaded, which leads to exhaustion, more or less permanent, of the heart muscle, and to subsequent degenerative processes in its muscular fibres; even sudden dilatation of the heart is liable to occur from over-exertions, and I have witnessed such a case in a phthisical patient which proved rapidly fatal.

The non-resistance of lung tissue to tubercular invasion and extension, if not produced, is certainly favored by nutritive disturbances due to anæmia and a frequently associated small and weak heart, and either is apt to be preceded as a primary cause or attended as a result by dyspepsia and other gastric complications. Thus a good circulation goes with good digestion and *vice versa*.

We all know how much more favorable the prognosis may be in a given case, when, other things being equal, we have a good heart with good digestion, as compared with one in which all our efforts to secure these advantages prove ineffectual, and we also know how we would avoid any medication or treatment which influences one or the other for the worse, as scrupulously as we would maintain it if it kept the heart and digestive functions at their best.

All my cases show that the heart action is seriously affected, sometimes for weeks, by such over-exertion, and that with it the appetite is lost and loss in weight occurs most regularly, and it is therefore not to be wondered that with frequent repetition of over-exertions, the downward course, formerly attributed to the natural tendency of the disease, is by rights referable to mistaken self-management or want of control by the professional attendant in the many cases, who make unnecessary shipwreck in their journey for health, both at home and at climatic resorts.

Furthermore, if Metchinkoff's and Buchner's observations continue to stand uncontradicted, and the leucocytes and the blood serum are primarily instrumental in the destruction and removal from the organism of the infecting bacilli, thereby limiting and preventing their extension to healthy tissues, we can see that in tubercular disease any hindrance to the circulation must of necessity diminish the quantity of blood, the number of these so-called phagocytes able to reach the affected part, or the line of defence which for the time being becomes less effectually guarded allowing of greater proliferation, activity and extension of the germs.

But let the explanation be whatever it may, clinically I have experience which, to me, admits of no more doubt that heart fatigue is seriously detrimental to phthysical patients, than I have of the known action of opium or chloroform, or of the relation of the bacilli of Koch to tubercular disease, and I only wish that I knew what more I could say or do, or that I might have sufficient eloquence and power to convince, so as to impress upon the mind and conscience of every physician who advises and treats phthysical patients the great importance of its prevention; and I am equally convinced that, if I so succeeded, I should have contributed more toward the successful treatment of consumption than has been done by any advance made in this field of therapeutics for many a year past.

Error in the opposite direction is, however, possible, although not fraught with a corresponding amount of danger, and I certainly do not wish to be understood as underestimating the benefits of the rational employment of exercise in the management of phthisis, especially in conjunction with out-of-door life; I only warn against its abuse.

Nothing could be further from my mind than to recommend absolute rest and inactivity, unless during the existence of fever, acute processes, and certain complications. I believe exercise, short of amounting to fatigue, is highly beneficial to the best circulation, nutrition of tissues, and elimination of waste products, and the want of such to be justly looked upon as a predisposing factor in the acquirement of the disease.

Whenever I am obliged to dispense with exercise I substitute massage, the use of the faradic current, or both, with

much benefit. The mental faculties, too, require proper exercise by light instructive study and literature, innocent and unabsorbing social games, pleasant conversation, enjoyment of natural scenery, music, etc., which are indispensable to the proper diversion of the patient's mind.

The amount of physical and mental exercise must, however, be carefully regulated for each patient, and must remain within the limits of safety at all times. The advice must not be given in a general way, but according to the circumstances of the case, the day, or even the hour. What one patient may do with benefit may prove harmful to another, and what is a proper amount of exercise at one time may lead to disaster under conditions of fever, the presence of complications, etc. It is always best to begin with the minimum and to gradually test the patient's reaction by observations of pulse, temperature, and appetite, loss or gain in flesh, etc., and the physician in an institution must have tact enough to do that for himself at opportune times. The patient is hardly ever to be burdened with the responsibility, and in private practice it requires the competent supervision of a nurse or attendant, without which we had, as a rule, better forego some of the information, for most patients become nervous and timid from such exact knowledge, and I can imagine no more miserable state of feelings and apprehension than that which the consumptive patient, especially if a physician, works himself up to, who at all times and opportunities has his fever thermometer under his tongue and his finger upon his radial artery, and I have frequently been obliged to demand the surrender of the former and the cessation of pulse-counting, to make any progress at all.

Mr. President, I know that many members of this Association share my views, and I make this communication not so much for instruction of the members, but rather that, by their approval, the profession at large may thereby be made the more ready and willing to take cognizance of a preventable and serious obstacles to the more successful management of a disease, the limitation of which is the chief object of the labors of this Association.

TUBERCULOSIS IN THE CRIMINAL CLASS.

By WILLIAM DUFFIELD ROBINSON, M.D., Philadelphia.

PERHAPS little excuse can be offered to this Association for presenting a sketch titled as above, unless it be to call its attention to a distinct class of humanity possessed of well-defined characteristics—a class interesting in the history of its antecedents and in the habits of life of its respective component individuals. Criminals of every grade are found intermingled among all classes of society and in all places, but the general practitioner has little opportunity to study a sufficient number of cases for obtaining reliable information in regard to them, until such cases have been caught and caged. Even then, indeed, they are usually only accessible for proper study by the medical man who has charge of their health in the various institutions for their detention after conviction. One experienced in dealing with the crime-class people can usually recognize a criminal, but it is indeed difficult to so explain the distinguishing characteristics that another may be able to know the criminal face with reasonable certainty. Many points of peculiarity as to head, form, pupillary distance, etc., have been made as pertaining especially to criminals. But among a large number of convicts there are found many well-proven chronic criminals who have characteristics of physiognomy, etc., quite directly opposite to asserted laws.

In the Eastern State Penitentiary of Pennsylvania, an institution of which the average population is about eleven hundred, the study of the death causes during the past sixty years shows that more than fifty per cent have been due to tubercular diseases. In this institution there have been received about five hundred and fifty new convicts during each of the past ten years. Of these, about eighteen per cent could give no history of their parentage or family health records. Many more could but imperfectly do so. Among those who knew of their family deaths it is well demonstrated that tubercular disease has been remarkably prevalent. Hereto is appended

the histories secured from among four hundred and eighty convicts received during one year, which gives a fair average demonstration of that of each year. They are, of course, histories of convicts consecutively taken, and not from selected ones.

Convict Number.	Age.	No. of Con- victions.	
A 1487	31	4	Father, mother, brother and sister died of consumption; convict has consumption.
A 1488	19	1	Father, mother, brother and sister died of consumption; convict has consumption.
A 1489	20	1	Father died of consumption.
A 1496	28	4	Convict has consumption.
A 1499	51	1	Convict has consumption.
A 1505	32	1	Mother died of consumption.
A 1506	20	3	Mother and brother died of consumption.
A 1509	32	1	Father, mother and brother died of consumption; convict has consumption.
A 1513	23	1	Father and uncle died of consumption.
A 1518	27	1	Convict has consumption.
A 1520	22	1	Convict has consumption.
A 1533	20	2	Father and mother died of consumption.
A 1547	31	3	Mother died of consumption.
A 1549	22	1	Father died of consumption.
A 1550	35	1	Father and mother died of consumption.
A 1556	20	1	Mother died of consumption.
A 1557	21	1	Father and mother died of consumption; convict has consumption.
A 1558	32	5	Father and brother died of consumption.
A 1564	23	1	Mother and brother died of consumption; convict has consumption.
A 1566	34	1	Mother and brother died of consumption; convict has consumption.
A 1568	24	3	Father, mother and sister died of consumption.
A 1570	21	1	Father, mother and brother died of consumption.
A 1574	25	2	Father and mother died of consumption.
A 1577	23	1	Convict epileptic.
A 1575	23	1	Sister epileptic.
A 1582	19	1	Father died of consumption, mother of cancer, three brothers epileptic.
A 1585	38	2	Father insane.
A 1589	39	1	Father, two brothers and one sister died of consumption.
A 1593	17	2	Mother and sister died of consumption.
A 1596	18	2	Sister died of consumption.
A 1597	25	6	Father and mother intemperate; convict epileptic.
A 1599	29	3	Father, three brothers and two sisters died of consumption.
A 1601	18	1	Father died of consumption, sister died of epilepsy.
A 1605	31	1	Father, mother, three brothers and two sisters died of consumption.
A 1607	21	1	Convict insane.
A 1611	60	5	Mother and three brothers died of consumption, father and one brother of epilepsy.
A 1612	25	3	Mother and aunt died of consumption.
A 1613	39	2	Mother and brother died of consumption.
A 1618	16	2	Father died of consumption.
A 1620	18	1	Father, mother and uncle died of consumption.
A 1621	20	1	Father and mother died of consumption.
A 1623	31	6	Three brothers died of consumption; convict has consumption and cancer of womb.
A 1631	32	2	Father, mother, six brothers and two sisters died of consumption; convict has consumption.
A 1634	36	1	Mother died of consumption.
A 1635	26	3	Brother died of consumption.

Convict Number.	Age.	No. of Con- victions.	
A 1637	25	1	Mother died of consumption.
A 1642	19	2	Mother died of consumption.
A 1652	31	2	Father and mother died of consumption.
A 1654	27	1	Convict has consumption.
A 1655	22	1	Father died of insanity.
A 1656	23	3	Mother and two sisters died of consumption.
A 1657	38	2	Sister died of consumption.
A 1661	31	5	Mother died of cancer.
A 1663	36	3	Mother died of consumption, brother of epilepsy.
A 1664	56	3	Father died of consumption.
A 1668	38	1	Mother and sister died of consumption.
A 1675	29	1	Mother died of consumption.
A 1676	21	3	Mother died of consumption.
A 1677	24	1	Mother died of consumption.
A 1684	25	2	Mother and brother died of consumption.
A 1685	40	1	Father and mother died of consumption.
A 1686	22	1	Father died of consumption.
A 1687	44	1	Mother died of consumption.
A 1688	32	1	Mother died of consumption, father and sister insane.
A 1693	26	6	Father died of consumption.
A 1695	45	2	Sister died of consumption, aunt insane.
A 1699	19	1	Father died of consumption.
A 1701	25	1	Father and mother died of consumption.
A 1703	23	1	Father and mother died of consumption.
A 1704	32	1	Mother died of cancer.
A 1705	36	1	Two brothers died of consumption.
A 1708	34	1	Mother died of consumption.
A 1712	45	1	Father died of consumption.
A 1713	21	1	Father died of consumption.
A 1715	32	2	Father, three brothers and one sister died of consumption, brother and sister epileptics.
A 1716	52	2	Brother died of consumption.
A 1718	45	1	Father, mother and brother died of consumption.
A 1720	34	1	Father died of consumption.
A 1723	21	1	Sister died of consumption.
A 1724	29	1	Father and mother died of consumption.
A 1725	33	1	Mother and brother died of consumption.
A 1736	25	1	Mother and sister died of consumption.
A 1737	31	1	Mother and brother died of consumption, father died of rum.
A 1738	32	2	Father and mother died of consumption.
A 1739	30	3	Father and mother died of consumption.
A 1741	34	1	Sister died of consumption.
A 1742	29	3	Father died of consumption, mother insane.
A 1743	35	1	Four uncles insane.
A 1752	25	1	Two brothers died of consumption.
A 1757	24	4	Father died of consumption.
A 1759	27	2	Mother died of consumption.
A 1770	32	2	Father and four uncles died of consumption; convict has consumption and impaired intellect.
A 1775	64	5	Father and mother died of consumption.
A 1776	24	1	Father and two brothers died of consumption.
A 1783	53	1	Father and mother died of consumption.
A 1785	72	3	Father died of consumption.
A 1789	24	1	Mother and brother died of consumption.
A 1791	33	1	Father and brother died of consumption.
A 1794	26	2	Father and mother died of consumption.
A 1798	22	2	Brother died of consumption.
A 1799	23	1	Brother died of consumption.
A 1800	25	1	Mother died of consumption.

Convict Number.	Age.	No. of Con- victions.	
A 1801	30	2	Mother died of consumption; convict has consumption.
A 1803	40	2	Father and sister died of consumption; convict a crank.
A 1805	18	1	Four brothers and one sister died of consumption.
A 1806	23	1	Consumption in family; convict has consumption.
A 1810	17	1	Mother died of consumption.
A 1811	17	1	Mother died of consumption.
A 1813	38	2	Father, mother, two brothers and one sister died of consumption.
A 1822	28	1	Brother and sister died of consumption.
A 1823	17	2	Father died of consumption.
A 1824	21	2	Father died of consumption.
A 1825	24	6	Father died of consumption.
A 1826	19	1	Father died of consumption; convict has consumption.
A 1831	32	3	Father and grandfather died of consumption.
A 1832	22	2	Father and mother died of consumption.
A 1837	28	1	Father died of consumption.
A 1841	24	3	Father and brother died of consumption.
A 1845	26	1	Father, mother and brother died of consumption; convict has consumption.
A 1846	45	1	Brother died of consumption.
A 1850	30	3	Mother died of consumption.
A 1852	21	2	Three uncles died of consumption.
A 1853	27	5	Mother and two sisters died of consumption.
A 1856	46	2	Mother died of consumption.
A 1857	30	1	Father and mother died of consumption.
A 1860	22	1	Father died of consumption.
A 1862	32	1	Mother died of consumption.
A 1863	27	2	Brother died of consumption.
A 1864	21	1	Father died of consumption.
A 1866	35	1	Mother died of consumption.
A 1870	28	2	Father, mother and sister died of consumption.
A 1875	46	1	Sister died of consumption.
A 1878	37	1	Father, mother, two brothers and two sisters died of consumption.
A 1880	26	1	Father died of consumption.
A 1882	21	1	Father, mother, two brothers and two sisters died of consumption; convict has consumption.
A 1883	35	1	Mother, brother and sister died of consumption.
A 1885	42	1	Father and mother died of consumption.
A 1886	42	1	Father, mother and aunt died of consumption.
A 1888	49	1	Sister died of consumption—only family history known.
A 1889	24	3	Father and mother died of consumption.
A 1891	48	1	Brother and two sisters died of consumption.
A 1892	29	1	Brother and two sisters died of consumption.
A 1897	21	1	Brother and sister died of consumption.
A 1899	26	2	Brother died of consumption—only family history known.
A 1902	33	1	Mother died of consumption.
A 1905	36	2	Father died of consumption.
A 1906	23	1	Father, four brothers and sister died of consumption.
A 1907	18	1	Father and mother drunkards.
A 1913	38	1	Brother died of consumption.
A 1914	25	1	Father died of consumption.
A 1916	23	1	Mother and brother died of consumption.
A 1917	37	1	Father died of consumption.
A 1918	20	1	Father and sister died of consumption.
A 1921	21	1	Mother and two aunts died of consumption.
A 1924	27	3	Sister died of consumption—only family history known.
A 1932	38	1	Father and mother died of consumption.
A 1933	22	1	Mother died of consumption; convict epileptic.
A 1935	30	6	Father and mother died of consumption.
A 1936	21	1	Mother, brother and sister died of consumption.
A 1937	30	1	Father and brother died of consumption.

Convict Number.	Age.	No. of Con- victions.	
A 1938	24	1	Father and mother died of consumption.
A 1940	37	1	Mother, brother and sister died of consumption.
A 1943	28	6	Father died of consumption.
A 1948	20	1	Mother died of consumption.
A 1950	27	1	Father and mother died of consumption.
A 1951	25	1	Mother died of consumption, father died of rum.
A 1953	27	2	Father and mother intemperate.
A 1956	35	4	Brother died of consumption, sister of epilepsy.
A 1959	44	1	Father, mother, sister and three aunts died of consumption.
A 1966	27	3	Father died of rum.

From eight to twelve per cent of the convicts in a State prison will be found to be of this criminal class. In their crime doing is so inherently a dominant factor in their characters, that they never cease the commission of crimes. For the greater part of their lives they may have been subjected to the most efficient and rigorous means known for their reformation, but with practically no effect on their morality. The most prolonged punishments by prison confinement proves equally ineffective in inducing them to lead better lives. Although it is possible for an experienced expert in criminal study to readily recognize in his early history one who will inevitably always be found enrolled among the crime class, it will nevertheless be accepted with less doubt that a man should properly be here classified, if a sufficiently long history can be obtained to practically prove the correctness of so recording him. Only the worst class of criminals and those sentenced to prolonged periods of incarceration are placed in State prisons. A study of the records of a State prison over a period of fifty or sixty years, will show that when a man has three or more times been sent to such a prison, his name thereafter will be repeatedly found enrolled until the end of his life. A selection, in consecutive order, of two hundred convicts who have been three or more times convicted and sent to penitentiaries, and a study of the family health history of each of these respective individuals, demonstrates that $74\frac{6}{10}$ per cent of them have had occur three or more deaths from tubercular consumption in their respective immediate families, within the limit of father, mother, brothers, and sisters. This is certainly remarkable, and would seem to point strongly to the existence of a defective physical make-up as accounting for the abnormally immoral lives of these

people. It would seem that such physical inheritance had also to do with the styles of crime committed by such unfortunate persons. Of 367 convicts who died of consumption in the Eastern State Penitentiary during the past sixty years four $\frac{9.2}{100}$ ($4\frac{9.2}{100}$) per cent were convicted of assault and battery, while of the entire criminal population of that period seven $\frac{3.4}{100}$ ($7\frac{3.4}{100}$) per cent were convicted of this crime; $\frac{5.5}{100}$ of one per cent of the convicts who died of consumption were convicted of murder in the first degree, while $\frac{3.7}{100}$ of one per cent was the proportion convicted of this crime in the total population. In murder in the second degree the respective percentages were $6\frac{1}{100}$ as against $2\frac{4.6}{100}$; counterfeiting, $1\frac{6.3}{100}$ as against $3\frac{7.5}{100}$; embezzlement, $1\frac{0.1}{100}$ as against $\frac{6.3}{100}$; horse-stealing, $4\frac{1.1}{100}$ as against $3\frac{1.0}{100}$; robbery, $5\frac{7.4}{100}$ as against $4\frac{2.1}{100}$; burglary, $23\frac{7.5}{100}$ as against $14\frac{4.3}{100}$; larceny of all forms $38\frac{5.4}{100}$ as against $45\frac{0.7}{100}$; arson, $4\frac{1.0}{100}$ as against $2\frac{1.4}{100}$. Closely noticing these figures shows that in some crimes, such as burglary and arson, the percentage is almost double in the convicts dying of consumption as compared with the percentage found among the entire prison population.

"BEING DEAD YET GIVETH" (writes the London correspondent of the *American Practitioner and News*, April 25th, 1891) would be an appropriate description of the curious ceremony which has just taken place in the parish of St. Leonard, Shoreditch. In connection with the local charities, under the provisions of the will of Mr. D. T. Gorsuch, surgeon, of Shoreditch, who died in 1820, the sum of £9 is distributed each year to eighteen poor persons who have been most regular in attending divine service at the parish church, and are the most deserving objects of charity. Under the will each dole of 10s. is placed upon the tombstone of the donor in the churchyard, and is picked up by the recipient. This ceremony has again just been carried out, when eighteen aged parishioners, one of whom had reached her eighty-seventh year, picked up their half sovereigns from the grave. This quaint custom emphatically identifies the gift with the donor, and produces a sort of realistic effect, as if the charities were still received from the deceased man himself.

MEMORIAL OF DR. A. Y. P. GARNETT.

ALEXANDER YELVERTON PEYTON GARNETT was born in Essex County, Va., September 19th, 1820, and was the son of Muscoe Garnett and Maria Battile, his wife. Among his ancestry were many of the best known old families of Virginia.

His boyhood was spent at his home, and his education conducted under private tutors without any incident worthy of mention.

He began the study of medicine at the University of Pennsylvania at the age of nineteen, graduating therefrom in 1842, and after passing his examination before the Naval Medical Board was appointed Assistant Surgeon in the Navy. His first cruise was to the Pacific, under Commodore Stribling, on the United States steamer "Cyane;" while on a subsequent cruise he visited South America, and at Rio met the lady who subsequently became his wife, Miss Mary Wise, the daughter of Henry A. Wise, of Virginia, then United States Minister to the Court of Brazil. After his marriage he was stationed temporarily at Washington, but soon resigned his position in the Navy and began his career as a civil practitioner. From the first he was very successful, and throughout his long career he continued to be a popular physician and to gain and hold the friendship and regard of his patients. His success can, in a measure, be attributed to the active interest he took in his profession, his skill as a diagnostician, and to the remarkable attractiveness of his manner.

He was soon elected to the chair of Theory and Practice of Medicine in the National Medical College, which position he filled acceptably.

At the outbreak of the Rebellion his sympathies were warmly enlisted with his native State; he left Washington for Richmond, Va., where he remained until the close of the war. So many of his friends and former patients were in this city that he very soon found himself actively engaged in as large a practice as before his removal.

He was appointed surgeon in the Confederate Army, and placed in charge of two hospitals. He was also a member of

the Board of Medical Examiners to examine applicants for admission to the Medical Corps. These positions he continued to hold during the entire war. He was the physician of General Lee and family, as well as to the families of Generals Joe Johnston, Hampton, Preston, Breckenridge, and of many members of the Confederate Cabinet and Congress.

At the termination of the war in 1865, when Richmond was evacuated, Dr. Garnett, at the request of Jefferson Davis, accompanied him as a member of his personal staff, but after the surrender of Johnston's army he returned to Richmond a paroled prisoner.

He resumed the practice of his profession in Richmond, but in 1865 returned to Washington. Here he immediately found himself engaged in active practice and in lecturing. He was elected to the chair of Clinical Medicine in the Medical Department of Columbian University, which position he held for many years. He also became one of the Board of Directors of the Children's Hospital, and served as President of the Medical Society and of the Medical Association of the District of Columbia.

In 1874 he was chosen President of the Southern Memorial Association of Washington, and selected to deliver the oration upon the occasion of the interring of the dead of Early's army, who had fallen in the attack upon Washington. His address upon that occasion was very appropriate and conciliatory in its tone.

Dr. Garnett was elected President of the American Medical Association, and presided at its meeting in 1886. His address on medical education excited a great deal of notice and approval at the time, as he brought into very broad relief the evils of medical education in this country.

His last public work was in connection with the meeting of the International Medical Congress, held in Washington in 1887. It is well known how many obstacles and difficulties attended the completing of the arrangements for that meeting, and it was only by dint of most arduous labor and untiring energy that Dr. Garnett, as Chairman of the Committee of Arrangements, gave it so large a measure of success. There is no doubt that the anxiety of mind and physical fatigue attendant upon his duties at this time helped to bring on the

failure of health which ended in his sudden death in the summer of 1888.

Dr. Garnett contributed a number of papers to medical journals, which were all of great practical value and interest. The paper which he read at the meeting of this Society, in 1887, entitled "Observations on the Sanitary Advantages of Tide Water Virginia," is a fair example of his thoroughness in the treatment of medical questions.

HARDENING PLASTER.—M. Julte has recently communicated to the French Academy of Sciences a process of hardening plaster so as to adapt it to the construction of flooring in place of wood, and to other purposes for which it cannot be used in its ordinary state, on account of its want of hardness and resistance to crushing. It is effected by intimately mixing six parts of plaster of good quality with one part of finely sifted, recently slaked white lime. This mixture is employed like ordinary plaster. After it has become thoroughly dry, the object manufactured from it is saturated with a solution of any sulphate whatever whose base is precipitated in an insoluble form by lime. The sulphates best adapted for the purpose, from every point of view, are those of iron and zinc.

With sulphate of zinc, the object at first greenish, finally assumes through desiccation the characteristic tint of the sesquioxide of iron. The hardest surfaces are obtained with iron, and the resistance to breakage is twenty times greater than that of ordinary plaster. In order to obtain a maximum of hardness and tenacity, it is necessary to temper the limed plaster well in as brief a space of time as possible, and with no more water than is strictly necessary.

The plaster cast, or other object to be hardened, should be very dry, so that the solution employed may penetrate it readily. The solution should be near the point of saturation, and the first immersion should not exceed two hours. If immersed too long, the plaster would become friable.

The proportions of the lime and plaster are arbitrary, and may be varied according to the results to be obtained; nevertheless the proportions of one to six have given the best results.

ERYTHROXYLON COCA: THERAPEUTIC, HYGIENIC.

By P. DE PIETRA SANTA, M.D., Paris, France.

“Coca possesses the penetrating aroma of vegetable stimulants, the tonic properties of astringents, the antispasmodic qualities of bitters, and the nutritious, mucilaginous principles of the analeptic or alimentary plants.”—LINNÆUS.

WHEN all the nations of the civilized world in a noble concert of enthusiasm and of gratitude are preparing to celebrate with the greatest *éclat* the four hundredth anniversary of the discovery of America by Christopher Columbus, it appears to us opportune to review the various acquisitions to therapeutics and hygiene for which old Europe is indebted to young America.

After Peruvian bark, the first in chronological order as well as in importance is incontestably Peruvian coca, with its precious alkaloid, cocaine. If the introduction of coca into France at the beginning of this century did not create much stir, if for quite a long period it remained merely a scientific curiosity, and as the appanage of celebrated travellers who had learned its worth in its native country (Pappig, Tschudy, Mantegazza, *et al.*), it must be admitted, nevertheless, that it has been constantly the subject of earnest study, of varied researches, of endless experiments in the laboratories of chemistry and of physiology, and of most searching clinical observations.

It was principally from 1862 to 1870 that this movement for scientific investigation received a stimulus which caused Professor O. Reveil in 1872 to say: “This substance is destined to take an important rank in therapeutics.”

The inaugural theses read before the Faculté de médecine of Paris by Demarle (1862), Moreno y Maiz (1868), and Ch. Gazeau (1870), and before the faculty of Strassburg by Lippmann (1868), gave to coca its standing in modern therapeutics by establishing in a positive way this fact—viz.: “That it produces an exaltation of life, an increase of muscular energy.” To Ch. Fauvel belongs the merit of signaling a second fact

no less remarkable : " The anæsthetic action of coca on the mucous membrane of the pharynx, with its stimulating action on that of the larynx, have given it its characteristic name ' The tensor *par excellence* of the vocal bands.' "

Before enumerating the various therapeutic resources that coca offers us, it will not be amiss if we sketch the state of the question as it presents itself in Peru and other republics of South America. These descriptive data have been furnished the Société française d'hygiène in an interesting communication by Dr. Manticuzo, Colombian Consul at Tucuman (Argentine Republic).

" Coca, indigenous to Bolivia, thrives in warm and moist regions free from frost, called ' jungas.' The aborigines of the country employ it usually by chewing the leaves to extract the juice. When the coca leaf is masticated, the juice, impregnated with saliva, acquires positive alimentary properties. It restores the flagging powers lost by physical or mental labor and becomes an efficacious stimulant in gastric and intestinal dyspepsia ; it is in these conditions that coca is indicated to supply extra nerve force during long journeys by postilions, couriers, and soldiers."

The Bolivian army is regularly supplied with coca leaves, which form an integral part of their campaign rations.

These data, founded on the experience of centuries, carry with them the usual accompaniment of the marvellous and the supernatural, causing this celebrated plant to be looked upon by the natives of South America as an animated representation of the divinity, which, confirmed by modern researches, assigns to coca the precious and characteristic properties found concentrated in its essential alkaloid, cocaine, the physiological and therapeutic action of which has been so well elucidated through the works of Dr. Carl Koller in 1884, and Marc Laffont in 1888.

Let us go a step further into the domain of clinical observation. The stimulation of cerebro-spinal activity produced by coca, and that Mantegazza had foreseen, has been studied with great care by Feignaux and Libermann. The former asserts that it is marked in all cases " where a nervous trouble would seem to result from an atonic condition." The latter extols its use in the form of " vin Mariani" to combat morphinomania, nicotinism, and alcoholism.

The special applications of coca in the form of a diffusible "vin tonique," prompt in action, have been stated with precision by Dr. Mallez, "in those cases of depressed condition of the system and marked impoverishment of the blood resulting from the prolonged abuse of balsamics;" by Barth, Pidoux, Germain Sée, and many others "in chronic affection of the respiratory organs," where it always proves an element of tonicity and comfort.

In the successive and varied manifestations of tuberculosis it is vain to expect of coca antibacillary or germicidal properties; its action is far more certain, far more efficacious, and much deeper, in that it favorably modifies the prognosis by placing the system in a state of effective defence and, so to speak, making it impregnable.

In this connection I may be pardoned for recalling what I wrote in 1875 in a volume entitled "*Le traitement rationnel de la phthisie pulmonaire*": "I prescribe daily with success and benefit coca in its most convenient, most agreeable, and most active form—that of vin tonique Mariani." Mariani must be justly considered as the introducer and the apostle of the fortunate importation of coca to Europe.

The periodic progress that has been made in our day in prophylactic hygiene and preventive medicine could not ignore the essential properties of the Peruvian plant. Coca has fully lived up to the promises and expectations that we hoped to realize, and even those who, in a spirit of disparagement, more or less interested, had conjured up before the public the spectre of cocaism, finally realized that they were only unconscious plagiarists. In cases of abuse similar accusation had been formerly brought against coffee and tea, and yet the hygienic and therapeutic value of these precious substances has remained resplendently intact through ages and among all civilized people.

As to the opposition of constitutional skeptics or chronic fanatics, this cannot be of long duration in an epoch that Lubonski called, very justly, "*L'époque de l'anémie et du lymphatisme*," and which inspired our great writer Michelet with the alarm cry: "This frenzied life that we are leading to-day (*in aere parisiensi*), this life of terrible toil and excesses, it is upon the children that the consequences fall."

There lies the origin of the success of vin de coca in that, starting from a modest laboratory, it has spread like a beneficent train of blessing among all classes of the French population, to cross successively all the frontiers and carry back beyond the Atlantic, with all the improvements of art and of science, the gift that America had formally made to Europe.

This rapid historical sketch would show a regrettable gap if I did not summarily indicate the powerful support that certain circumstances of our social life have given to the general employment of the vin de coca.

In a recent communication to the Academy of Medicine, Dr. Lancereaux did not hesitate to affirm (with clinical notes in hand) that chronic intoxication through essential drinks (absinthe, vermouth, amer picon, vulneraries, etc.) was spreading more and more, especially among ladies, their delicate taste naturally leading them to prefer cordials. "These drinks," he exclaimed, "cause the greatest ravages, for not only do they engender nervous complications which too often cause death, but they are besides the cause of denutrition or a weakening of the system which predisposes to tuberculosis, and causes death through pulmonary diseases. Consequently they should be considered as one of the greatest causes of depopulation."

As a conclusion to his address, Dr. Lancereaux asked the Academy of Medicine to warn the public of these dangers they were generally ignorant of, and the authorities whose mission it was to guard the public health.

I have truly but limited confidence in the intervention of the public authorities by the limitation of the sale of spirits and by high license, added to the high tax already levied on spirits; but I walk hand in hand with this eminent clinician when he proposes to enlighten public opinion by popular instruction, by hygienic tracts, and by illustrated lectures.

Advancing a step further in the domain of practical remedies, I would propose to give to alcoholic drinks and to essential liquors, as an efficacious and infallible succedaneum, the vin de coca Mariani, the moderator *par excellence* of the nervous, the tonic of muscular fibre, the strengthener of the weakened system—in a word, the unquestioned alleviator of physical suffering.—*N. Y. Medical Journal*, June 27th, 1891.

ALFRED RUSSEL WALLACE, LL.D., D.C.L., F.R.S.,
AND THE ROYAL COMMISSION ON VACCINA-
TION.

THE third report of the Royal Commission on Vaccination is in the main taken up with the evidence of witnesses who are opposed to the practice of vaccination. The witnesses in question are, as a body, not men who can be regarded as generally possessing scientific knowledge on the subjects with which they deal, but there is one notable exception to this rule in the person of Dr. Alfred Russel Wallace, whose conversion to the principles of anti-vaccinators was hailed as a great triumph by the party he joined, and whose scientific antecedents make it especially interesting to take note of the grounds on which he has, late in his public career, adopted the attitude in question. His works are numerous and well known, they embrace a number of scientific subjects, and they have won for him a reputation throughout the civilized world. The absence of a scientific basis for opposition to vaccination has hitherto been very marked, and if the hiatus could be filled, Dr. Alfred Russel Wallace might have been expected to have supplied the need. It is from this special point of view that we propose to examine his evidence, which very largely deals with the question from the statistical point of view.

And we take this course the more readily because Dr. Wallace himself, on his first appearance before the Commission, distinctly set it out that it was as a scientific expert, as one capable of handling and accustomed to deal with scientific evidence that he came forward. "I hope we are all scientific inquirers," urged the witness; and in bringing before the Commission that piece of his evidence which he deemed "the most important," he availed himself of a privilege which, at the time, he seemed entitled to claim, namely that of addressing an exhortation to the Commission in the following terms:

"Nothing is a matter of more common knowledge in science than that when you are seeking after causes, you must have

experiments which shall be strictly comparative—that is to say, one shall only differ from the other in regard to that special cause being present or absent. As an illustration I would just mention Dr. Tyndall's celebrated experiments on organic infusions and the production of life. The essential point of all his experiments was that each set should be exactly alike except in the condition that to the one of them air should have access, and that from the other air should be excluded. In the same manner Mr. Darwin, in making his experiments upon the fertility of seeds from self-fertilized and cross-fertilized plants, took care to grow his plants in the two halves of the same flower-pot, so that both experiments should be exposed to exactly the same conditions, and that when they arrived at maturity and produced seeds it could not be said that there was any difference in the conditions of the plants, except in the condition of the one being from seed of self-fertilized and the other from seed of cross-fertilized plants. Now, if we had a really good case of that kind—that is to say, a tolerably homogeneous population, of which one half was not vaccinated at all, and the other half had been vaccinated for a series of years, we should have an absolute test and demonstration. Fortunately for the purpose of arriving at the truth, we have an approximation to that condition of things in France."

Following on this proem Dr. Wallace submitted a vast mass of French statistics as to small-pox and vaccination; they cover no less than fifteen closely printed sides of foolscap; and they are also embodied in the form of a diagram, so that the lesson they affected to teach might be apprehended by the unlearned as well as by the scientist. And what is alleged to be that lesson? On this point Dr. Wallace says:

"Altogether the general effect is to show that the amount of small-pox mortality increases as the amount of vaccination increases. In order to determine whether that was a real fact, or only a deception of the eye, I have taken them out upon another plan. I have extracted the ten departments in which there was least vaccination, and the ten departments in which there was most vaccination, and have got out the averages by adding together the vaccinations and births for those departments. Then I have taken, in another set, the twenty

which are the least vaccinated departments, and the twenty which are the most vaccinated departments. In order that it might not be objected that these were selected groups, I have taken, also, the half which are least vaccinated and the half which are the most vaccinated, and the result is that taking them in tens the least vaccinated departments have least deaths from small-pox, and the most vaccinated departments have most deaths from small-pox ; and when you take the twenties you find that the least vaccinated have the least deaths from small-pox, and the most vaccinated have the most deaths from small-pox ; and when you divide them into halves you find again that the half which is the least vaccinated has the least deaths, and the half which is the most vaccinated has the most deaths. That really supports the view I have submitted to you from my previous diagrams, that so far from vaccination producing any visible diminution of small-pox mortality it goes rather the other way."

In short, the more you vaccinate the more small-pox you will have. "France," says Dr. Wallace, "is the only country in Europe in which there is no compulsory vaccination." And yet, oddly enough, in order to prove this "most important" point, Dr. Wallace actually passes over countries such as England, Germany, and others, where accurate statistics, as to vaccination, are available, and in which the death-rate from small-pox is equally well known, and he chooses France, where no similarly trustworthy records are kept, and selects among the years for his purpose those in which the Franco-German War put an end for a time to all pretence at accuracy as to the special vital statistics concerned. Surely Dr. Wallace, in so acting and in formulating the conclusions which he advanced, was abandoning his scientific principles, and was allowing himself to be used by obscurer men. He admits, indeed, that his friends, Messrs. Wheeler and Gibbs, had come to his assistance ; but, though, in answer to a question from Lord Herschell as to whether one of these gentlemen might not have started with a bias, he was obliged to answer, "No doubt ;" yet he confidently added, "but unless one falsifies his figures the figures remain." And he went on to claim the statistics as his own, stating definitely that in his preparation of them he "went over all of them twice."

Mr. Picton had, at a previous sitting of the Commission, announced the same belief that vaccination produced small-pox, but he had based this view on the fact that stational attendances for vaccination were greatest in years when small-pox mortality was greatest ; forgetting, apparently, the essential point that when small-pox prevails people, even including the nominal anti-vaccinationists, rush in unwonted numbers for vaccination. But the same view, emanating from a leading scientific authority, merited some attention, and it is evident that Dr. Wallace's statistics underwent careful examination at the hands of the Commission before the witness next appeared before them on March 5th, 1890.

At that meeting Dr. Wallace was, in the first place, asked why his tables included two departments of the same name, and why, while the figures relating to both were practically the same, the addition of the results, in one important particular, differed by some 13,000. The answer was, "It is a great puzzle to me ;" this being followed by an admission that the figures on which the argument was based had "got mixed up and confused." But Dr. Wallace appears to have thought lightly of mere statistical inaccuracy at this stage, for Lord Herschell soon found it necessary to tell him that "one does not accept statistics blindfold." The next point related to the department of Sarthe, as to which he was questioned by Sir William Savory, as follows :

"(*Sir William Savory.*) One more point with regard to the accuracy of these tables. Upon the first page, under the head of High Alpes, you reckon up the total and get 711 under the heading of 'small-pox deaths ;' it is a simple question of addition ; do you know that that really adds up to 1011, that it is 300 out by simple addition, and that instead of giving a percentage of 35.55 it gives a percentage of 50.55 ?"—"Yes, apparently it does ; that is a mistake evidently, but I do not think that there are many mistakes of addition of that kind, for I went over all of them twice."

"You would hardly like this table to go forth in this form as worthy of your scientific reputation, would you ?"—"I have not had the opportunity of comparing it with my manuscript yet."

"But so much is at stake. Are these returns compulsory

in the several departments?"—"That I do not know, except that they are official records; that is all we know of them; they are presented in the regular official form."

"Vaccination is not compulsory?"—"No, vaccination is not compulsory."

"So that young persons may be vaccinated at any age?"—"I presume they can; I do not know."

"Are not those very important facts? Have we not the important fact in our own country that between 1840 and 1853, before vaccination was made compulsory, when small-pox increased there was increased vaccination; and was it not in consequence of the discontent with that state of things, was not that one of the arguments used, that vaccination was made compulsory; is it not a very fair inference that there is a relation between the fear of small-pox and vaccination?"—"It may be explained in that way."

"At all events, is not that inference more scientific than the one that you draw from it?"—"I do not see that that could make any difference when you have the same law for the whole country. In France you have no compulsion for one department more than the other."

"But is it not likely that the law would be obeyed with more strictness in one department than another?"—"That is shown by the diagram."

"Would not that invalidate the inference you draw from it?"—"My inference is drawn from the diagram."

"But you have not, as I submit, data sufficient to draw an inference."—"That is a question."

"After what has occurred with regard to these tables do you still put forward this diagram as showing that vaccination instead of diminishing small-pox has rather an influence in increasing it?"—"I do not wish to put that forward as proved by this diagram, certainly."

At this stage the witness was apparently offered a chance of recanting, and he was asked what conclusion he still wished the Commission to draw. The answer is characteristic; it was to the effect that the conclusion remained "what I stated first;" but in the same breath, the original contention that "small-pox mortality increases as the amount of vaccination increases" was in reality superseded by the much milder

contention, "that there is no apparent connection in a beneficial sense between vaccination and small-pox." But even this modified form of unbelief naturally led to a further criticism of the statistics on which this new assertion was professedly based; and the result was a confession on Dr. Wallace's part that his tables were "not perfect," that "the imperfection is very great and irregular;" and an admission that if his entry of "no deaths" often meant nothing more than that there had been "no returns" (which was actually the case) "then, of course, the whole thing is imperfect," and that in view of such a defect, which was "vitally important, . . . the whole thing is valueless."

But criticism followed on criticism, and at last Dr. Wallace asked that he might make a few personal concluding remarks, the pith of which had to do with suggestions from the Commission that he must have "taken up this subject and written on it without full and accurate information befitting a man of science." And in making the personal explanation, the previous declarations as to the absolute need for a scientific accuracy such as had controlled the labors of Darwin seems to have been forgotten, and in their place came the frank admission: "My answer is that I did not take it up as a question of pure science."

Thus ended the "absolute test and demonstration" held out at the first sitting; and the result is that the party opposed to vaccination still lack a scientific statistician as an exponent of their views. Some of that party who claim that status seem studiously to avoid coming forward as witnesses, but it is sincerely to be hoped that the Commission will, before it rises, have the advantage of hearing an acknowledged expert in statistics on the side of the opposition, and not have to close their proceedings without having some better statistical data against vaccination than those which, as one of the Commissioners himself put it, relate "to foreign countries, which we have no means of verifying or the reverse." English experience over a sufficiently long period is ample to decide the question whether vaccination as practised in England is or is not a preventive of small-pox; and this is, after all, the one point at issue.—*The Practitioner*, June, 1891.

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION. SUPPLEMENT.

By Dr. H. R. STORER, of Newport, R. I.

IN THE SANITARIAN for October (p. 333, Vol. XXV.), 1890, I provisionally completed the list that had been undertaken of the medals and tokens then known to me in any way illustrative of sanitation. I have subsequently discovered additional pieces, and others have been communicated to me by correspondents. In the desire to create a still wider interest in a remunerative field of research, I now publish them.

Though the last of the previous series was numbered 1629, the first of those now to be given will be 1671, for the following reason. Not anticipating such a wealth of added material, I have hitherto inserted new pieces from time to time, affixing to them the number next which they would have properly belonged, with the letters a, b, etc. This has, however, occasioned confusion, and I will here give the list in question, showing how the apparent gap does not exist.

No.	Subject	Location	Source	Date	Sanitarian	Should be No.
400 ^a	Famine,	Poitiers,	SANITARIAN,	Oct., 1890,	should be	No. 1630.
466 ^a ,	"	Flanders,	"	Nov., 1889,	"	" " 1631.
470 ^a ,	"	Paris,	"	Feb., 1890,	"	" " 1632.
506 ^a ,	"	Germany,	"	July, "	"	" " 1633.
511 ^a ,	"	"	"	"	"	" " 1634.
554 ^a ,	"	"	"	"	"	" " 1635.
624 ^a ,	"	"	"	"	"	" " 1636.
650 ^a ,	"	England,	"	Feb., "	"	" " 1637.
650 ^b ,	"	Ireland,	"	"	"	" " 1638.
659 ^a ,	"	Barbadoes,	"	"	"	" " 1639.
695 ^a ,	"	Sicily,	"	"	"	" " 1640.
710 ^a ,	The Plague,	Dr. F. Forbes,	"	"	"	" " 1641.
713 ^{a-d} ,	"	Dr. J. Camerarius,	"	"	"	" " 1642-5.
726 ^{a-e} ,	"	Dr. A. P. T. Paracelsus,	"	"	"	" " 1646-52.
739 ^{a-b} ,	"	England,	"	Jan., "	"	" " 1653-4.
743 ^a ,	"	Marseilles,	"	May, "	"	" " 1655.
865 ^a ,	"	Milan,	"	April, 1889,	"	" " 1656.
867 ^a ,	"	"	"	June, "	"	" " 1657.
893 ^{a-b} ,	Small-Pox,	Dr. Mesner,	"	May, 1890,	"	" " 1658-9.
905 ^a ,	Inoculation,	Dr. B. Gale,	"	"	"	" " 1660.
959 ^a ,	Vaccination,	France,	"	"	"	" " 1661.
1019 ^a ,	Cholera,	Amiens,	"	Nov., 1889,	"	" " 1662.
1027 ^{a-c} ,	"	St. Roch,	"	"	"	" " 1663-5.
1062 ^a ,	"	Siam,	"	Jan., 1890,	"	" " 1666.
1066 ^a ,	Yellow-Fever,	Dr. Parkes,	"	Nov., 1889,	"	" " 1667.
1143 ^a ,	Syphilis,	Dr. John Hunter,	"	Jan., 1890,	"	" " 1668.
1216 ^a ,	Epizootics,	Cin. Soc., S. P. A.,	"	May, "	"	" " 1669.
1293 ^a ,	Mil. Hygiene,	William Ross,	"	July, "	"	" " 1670.

SECTION I. *Sanitation in General.*

(THE SANITARIAN, May and July, 1887.)

Besides the titles that I gave of works upon the deities of health and healing in connection with ancient numismatics, there are the following :

Gunzius, Justus Gottofredus. "Dissertatio qua *Δωδουχίας* in sacris *Æsculapii* succincte exponitur" (coins of Pergamena, p. 24). Leipsic, 1837, 4°.

Lersch, L. "Apollon der Heilspender (Ueber Silberter Erzstater)." Bonn, 1848, 4°.

Leyser, Polycarp. "Dissertatio de Salute Augusti ex nummis." Leipsic, 1723, 4°.

Panofka, . "Asklepios und die Asklepiaden." Berlin, 1846.

Wroth, Warwick. "A Statue of the Youthful Asklepios" (with figure of coin). *Journal of Hellenic Studies* (London), 1883. *Ibid.*, "Hygeia" (with figure of coin). (London), 1884. *Ibid.*, "Telesphorus." (London), 1882. *Ibid.*, "Telesphorus at Dionysopolis." (London), 1883.

Zornius, Peter. "Dissertatio de Telesphoro in nummis (etc.) veterum, *Æsculapii* et Hygeæ comite." *Miscellanea Groning.*, ii., fasc. 2.

I have ascertained that there is a companion medal to No. 2. 1671. Obverse. Bust to left. Inscription : Isaac Swainson.

Reverse. Bust of George III., as Prince of Wales, to left. Inscription : Georgius P(rinceps).S(enescallus).S(cotiae).C(ornubiæ).D(ux.)1799. This reverse is the obverse of a silver coin designed by Colonel Fullarton for Ayrshire. Battey, *Descriptive Cat.*, etc., i., p. 177, No. 1430°.

(3.) The reverse of this (of James Morison) is : Proclaimed | First | That The Vital | Principle Is In The Blood | Second | That All Diseases | Arise From Impurity Of The Blood | Third | That Such Impurity Can Only Be Eradicated | By A Purgative Such As | The Vegetable Universal Medicine Of The | British College Of Health London | Fourth | That The Deadly Poisons Used As | Medicines By The Doctors Are | Totally Unnecessary In | The Cure of Diseases

This very rare medal is in the Provincial Museum at Halifax, N. S., where I have had the opportunity of examining it.

1672. Obverse. Hygeia erect, in a contemplative attitude. Reverse blank. Lead. 27.

R. C. Davis Cat., January 22d-26th, 1890, No. 2096. In my collection.

To the Good Samaritan group there are several that may be added.

1673. Obverse. The usual type. Legend: Charitas Proximi

Kundmann, *Nummi Singulares* (etc.), Breslau and Leipsic, 1734, p. 134, pl. V., fig. 59.

1674. John, Duke of Montague, in 1751, by Dassier. Legend: Tv Fac Similiter.

Hawkins, Franks and Grueber, *Medallic Illustrations*, etc., ii., p. 663, No. 369, fig.

(1589.) Dr. Steeven's Hospital, Dublin, 1861 (Cusack Prize Medal). The group appears upon one of the armorial shields at base of reverse.

Frazer, *The Medallists of Ireland*, *Journal of the Royal Historical and Archæological Association of Ireland*, April, 1888, p. 325. In the Government (Lee) and Fisher collections.

(1591.) The medal of the Jervis St. Hospital, Dublin, 1885, has the group. *Ibid.*, July, 1887, p. 193.

(1592.) Also that of the City of Dublin Hospital, 1832. *Ibid.*, p. 194.

1675. Obverse. The Biblical Scene.

Reverse. Friendly Order of Good Samaritans, Hooley Hill, 1837. White metal, 42.

Sampson Cat., June 17th-19th, 1889, No. 1120.

1676. Obverse. The group. C. C. Wright Sc. Legend: Benevolence Knows No National Distinctions.

Reverse. Beremerenti (sic). A Token Of Friendship from W. Beach. Tin. Bushnell, *loc. cit.*, p. 114, No. 19.

The Good Samaritan is said to be represented upon the Italian Cross of St. George.

Thieme, *Numismatische Verkehr*, October, 1890, No. 3143.

The device also appears upon the seals of several medical institutions, as of the Massachusetts College of Pharmacy, the Methodist Episcopal Hospital of Brooklyn, N. Y., the Samari-

tan Free Hospital for Women and Children, London, etc. In the last of the instances mentioned the sufferer is a sick woman. The escutcheon of the Surgeons Guild at Leyden similarly bears the Good Samaritan. Dirks, Méreaux, etc., i., pl. CXLII.

There is also the following :

1677. Obverse. The group.

Reverse plain. Tin. 34. Woodward, Thirty-third Cat., December 8th-10th, 1880, No. 1012.

I have referred to the medals, ancient and modern, which chronicle recovery from illness. There is one which commemorates physical ailments as a means of spiritual perfection.

1678. Legend : In | Infirmi | tate Perfici | tur. Medal of Cardinal Giovanni Francesco Dal Bagno (Florence, 1578-), who in his youth was an invalid. Gaetani, *loc. cit.*, ii., p. 40, pl. CIX., No. 4.

The first medal that was struck to distinctly enunciate rules for the public health is thought to have been the following, upon the prevention of interments within the walls of the city of Breslau, in 1777.

1679. Obverse. A church, within a wide enclosure. Legend : Conserva Nos Domine In Pace.

Reverse. In.Memoriam | Auspicio.Et.Gratia | Friderici.II | Borus.Regis.Max.August. | Patris.Patriæ. | Optimi. | Sublata. Sapientissime | Ob. Avertendos. Morbos. | Ac. Conservandos.Cives | Intra.Urbis.Moenia | Sepulturæ | D.16.Nov. | MDCCLXXVII Silver. 37 mm. Pfeiffer and Ruland, *loc. cit.*, p. 172, No. 478.

When speaking of general sanitarians, the forerunner of all, Moses, of Judæa, should not be omitted. I now have learned of five medals in his honor.

1680. Obverse. Head to left, with a bullock's horns. Around neck a band with Hebrew Inscription.

Reverse. In four lines of Hebrew : Thou Shalt Have No Other Gods Before Me.

Gaetani, i., p. 1, pl. I., fig. 1.

1681. Obverse. As preceding, but with a ram's horns.

Reverse as preceding. *Ibid.*, pl. I., fig. 2.

1682. Obverse. Head as in the last. Inscription : Moises. Doctor.Ivdeorvm.

Reverse. Ego Mitissimvs Svper Omnes Homines * | Moises
| Palam Et | Non Per | Enigmata | Et Figvras | Videt Devm.
Ibid., pl. I., fig. 3.

1683. Obverse. Head. Inscription, in Hebrew : Moses,
The Father Of All The Prophets.

Reverse. A stone tablet, with the Ten Commandments.
Upon edge : Moise, Paris, 1827 Bronze. 21.

Haseltine Centennial Cat., Part VII., November 6th-8th,
1876, No. 1083.

1684. Obverse. Bust to right, with two front locks of
hair projecting. Upon neckband a Hebrew sentence. In-
scription : He(bræorum).D(ux).—Moses.

Reverse not given.

Rovillio, *Prontuario delle medaglie*, etc., Lyons, 1553,
p. 26, fig.

In addition to the general sanitary publications of Dr. H. I.
Bowditch (No. 23) there are the following :

“ Preventive Medicine and the Physician of the Future,”
1874 ; “ Address in State Medicine and Public Hygiene,”
Transactions American Medical Association, 1875 ; “ Sanitary
Hints,” 1876.

Dr. Elisha Harris (1824-84), of New York. “ General
Health Laws and Local Ordinances,” etc., *American Public
Health Association Report*, 1873. Cambridge, 1874, 8°.

Dr. Harris received bronze medals (Nos. 1230 and 1231)
from the Imperial Commission at the Paris Exposition of
1867, and from the International Societies of Relief, for a
railway ambulance. He might be again referred to for his
publications under Section II., Water Supply ; X., General
Epidemics, Vaccination, and Cholera ; and XIII., Registra-
tion ; as well as XI., Military Hygiene.

In speaking of the Boston Drs. Warren, I might have added
that their medals are not to be confounded with those in
honor of General Gouverneur K. Warren, of the Civil War,
which belong in the Rhode Island series.

Dr. James Wynne (1814-71), of New York. “ Public
Hygiene,” New York, 1847.

He received a medal (No. 1484) from the British Govern-
ment, which will be mentioned under Section X., Cholera,

and he has already been spoken of under Section XIII., Registration.

Besides the long list of tokens that I have given of Dr. John Howard, there are others still.

1685. Banbury, Oxfordshire.

Batley, i., p. 210, No. 1850.

1686. Emsworth (and Gosport). *Ibid.*, i., p. 100, No. 313.

1687. Lancaster Lancashire.

"L., Bristol and London." *Ibid.*, i., p. 114, Nos. 531-34.

1688. Portsmouth and Chichester.

"Darlington and Stockton, Durham." *Ibid.*, i., p. 92, Nos. 168-69.

There is also a medal of Howard which had previously escaped me.

1689. Obverse. Bust in profile. John Howard F.R.S. W. Mainwaring, fecit.

Reverse. Legend: *Haud ulli Mortalium Summa erga Humanum genus Benevolentia Secundus.* Exergue: *Ob. Jan. 20, 1792., Aet. 63.* (An error in date of death.) White metal. *Ibid.*, i., p. 72, No. 982.

Two medals were offered in 1890 by the Russian Government, through the St. Petersburg Juridical Society, upon the occasion of the International Prison Congress, for the best biography of Howard. No essay was thought worthy of the larger of these. Two of the smaller were awarded to Mr. Arthur Griffiths, of the British Prison Administration, and to Mr. Albert Riviere of the French Service. I have not as yet obtained a description of the medal.

SECTION II. *Water Supply.*

(THE SANITARIAN, August, 1887.)

Descriptions of ancient Roman aqueduct medals were additionally given by Frontinus, "*De Aqueductibus urbis Romæ*," etc. Patavia, 1722, 4°.

1690. One of the medals of the Marcian aqueduct was imitated by the Paduan engraver, Cavino.

Lawrence, *Medals of Giovanni Cavino, the Paduan*, New York, 1883, p. 15.

ENGLAND.

1691. Introduction of the New River water into London.
 1730. Bronze.
 Hawkins, Franks and Grueber, *loc. cit.*

BELGIUM.

1692. Fountain at Ypres, 1689-92.
 Cat. des Poinçons, etc., p. 190, No. 454; *Revue belge de numismatique*, January, 1887, p. 39.
 1693. Obverse. The Bourse at Brussels.
 Reverse. 1868 | Travaux | Pour Augmenter | Le Volume | Des Eaux (etc.). Alvin, *ibid.*, April, 1888, p. 226.
 1694. The "Meneker-pis" fountain at Brussels. Dubois, 1820. Silver. 35 mm.
 Bom Cat., 1884, p. 108, No. 3121.
 1695. Obverse. The City Arms. Inscription: Ville de Namur.—Emile Cuvelier. Bourgmestre.
 Reverse. Inauguration de la distribution d'eau.—3 août 1890. Only one hundred struck. *Ibid.*, October, 1890, p. 552.

FRANCE.

1696. The aqueduct of Arcueil, reconstructed in 1623.
Tresor de num., méd. franç., 2^e partie, xviii., 4.
 1697. Bringing the waters of Rosoir to Dijon. 1840.
 Delestre Cat., Paris, 1888, No. 439.

GERMANY.

1698. The Augustusbrunnen at Augsburg, 1753-65.
 Bauer Cat., Munich, 1886, No. 1651.
 There are German allegorical medals, as that of Heilbronn, which presents a rocky fountain surmounted by Christ, with the legend: Saliens Fonte Salutis.

SWITZERLAND.

1699. Les Eaux De La Dent De Broc Amenées A Gruyères (Geneva) 1890. *Bulletin de la Soc. Suisse de num.*, ix., p. 208.

SPAIN.

1700. Inauguracion Del Acueducto Burriel (Matanzas, Cuba). 1872. Gilt, copper. 40 mm.

Storer, *American Journal of Numismatics*, January, 1890, p. 58.

ITALY.

1701. The aqueduct at Mantua; represented upon the obverse of the medal struck by Napoleon upon the surrender of the city. In my collection.

Under the purification and house management of water might be mentioned two plumber's tokens.

1702. Foster & Metcalf, Grand Rapids, Mich.

Weyl, *loc. cit.*, No. 2479. In the collection of Dr. B. P. Wright, of Syracuse, N. Y.

1703. George McCaul, Grahamstown, New Zealand. Also in the Wright collection.

Michel Eugene Chevreul (1786-1890), of Paris. By his work on "Sanitary Influences" he introduced the practice of charring the interior of water casks.

1704. Obverse. Head to left. Beneath: Alphée Dubois. Inscription: M. E. Chevreul Membre De L'Academie Des Sciences.

Reverse. Offert | Le 31 Août 1872 | A L'Illustre | Doyen Des Chemistes | Par Ses Confrères | Par Ses Amis | Et Par Ses Admirateurs. Bronze.

Rüppell, *loc. cit.*, 1876, p. 5, cxcv^f. Rüppell erred in saying that Chevreul had died previous to 1880.

1705. A medal was struck in 1886, by O. Roty, upon Chevreul's centenary. *Revue belge de numismatique*, January, 1889, p. 217.

1706. A medallion by Ringel.

Dr. E. A. Parkes (No. 57) published a "Report on the Purifying Effect of a Sand Filter on Thames Water," etc. London, 1869, 8°.

To the tokens relating to water supply may be added:

1707. Obverse. Within a circle, rocks overgrown with moss. Beneath, Coquardon F. Inscription: * Si Vous Suffrez Venez A Moi

Reverse. Eau-Naturelle (etc.) Produits | De | Bussang | Rue St. Honoré | 333. | * Brass. 14. In the collection of Dr. Wright.

SECTION III. *Bathing.*

(THE SANITARIAN, August, 1887.)

1708. An imitation of No. 139, by Giovanni Canino, of Padua.

Cohen, *loc. cit.*, iv., p. 71, No. 10; Lawrence, *loc. cit.*, p. 21.

Dr. Johann Emmel (1797-1868).

1709. Obverse. Head to left. Inscription: Johann Emmel, Prac. Arzt, Gründer Der Wasserheilanstalt In Kaltenleutgeben. * | Geb. D. 6. Sept. 1797 † D. 28 Mai 1868 | J. Schwerdtner

Reverse. Head (different) to right. Erinnerung A.D. 50 Jahr. Jubiläum D. Wasserheilanstalt *24. Juli 1886* Schwerdtner Tin. 16 mm. In my collection.

Dr. Vincenz Priessnitz (1799-1851), of Gräfenberg.

1710. Obverse. Head to right. J. Schwerdtner. Inscription: * Vincenz Priessnitz | Geb. 5 Okt. 1799—Gest. 28 Novbr. 1851 | Begründer D. Natur Resp(ectif). Wasserheilkunde Im Jahre 1814*

Reverse. A fountain, supporting a statue. Wasser Vor Allem! Aus Wasser Kam—Ursprung, Wachsthum U. Heilkraft | Und was Thales Nur Ahnt, Priessnitz—Hat's Glücklich Vollbracht. Klager Exergue: *1874* 50 mm. In my collection.

1711. Obverse. Within wreath, *60. Jährige | Priessnitz | Jubelfeier | 1814-1874*

Reverse blank. Lead. 38 mm. In my collection.

THE UNITED STATES.

1712. Alameda Terrace Baths (San Francisco?) 1879. Prize medal for swimming. Gold. 23. Woodward, Forty-fifth Cat., March 6th-11th, 1882, No. 2863.

ENGLAND.

London, Middlesex.

1713. Obverse. An oval vapor bath on columns ; a person being shampooed. Inscription : The Dvkes Bagnio In Long Acre : Tvesday Fryday. Women.

Reverse. J D Y (James, Duke of York) in cipher, crowned, and enclosed by the Garter. Silver.

Hawkins, Franks and Grueber, *loc. cit.*, i., p. 538 ; Storer, *New England Medical Monthly*, December, 1886, No. 31.

“ The water was medicated or perfumed, and all the processes of shampooing performed. Men were not admitted on the women’s days.” This statement removes the implication of impropriety that has hitherto attached to this rare medal of admission.

Tynemouth, Northumberland.

1714. Medal of the Tynemouth Swimming Club. Battey, *loc. cit.*, i., p. 26, No. 303.

SCOTLAND.

Lochleven, Kinrosshire.

1715. Obverse. Queen Mary, imprisoned, etc. (1797.)

Reverse. Female standing in a tub, between thistles. Legend : Antient Scottish Washing * Honi.Soit.Qui.Mal.Y. Pense.

Battey, i., p. 60, No. 857.

This allegorical medal seems of sufficient interest to mention here.

FRANCE.

Lyons.

1716. Obverse. Within a beaded circle, and beneath an incused vine leaf : Bains | — | Ferret Inscription : Restauration Proprete Soins Empresses*

Reverse. Within a similar circle : Lyon | — | Inscription :
Quai Et Maison St. Antoine*

Edges beaded. Copper. 14. In my collection.

GERMANY.

Kiel, Schleswig Holstein.

1717. Obverse. Fr. | Kock | —.— | Kiel

Reverse. Within beaded circle : 30 | Pfennig | —.— | In-
scription : Badefloss No. 1. | * Ein Bad in Cabinet*

Edges milled. Brass. 15. In my collection.

SECTION IV. *Mineral Springs.*

(THE SANITARIAN, October, 1887.)

The ancient coins of Himera, in Sicily, bear a cock, the usual sacrifice to Æsculapius. The Rev. Dr. Scott has shown that this referred to its hot medicinal springs.

Ogle, Harveian Oration, 1880, p. 91.

Dr. Samuel Adolphus Cartwright (1793–1862), of New Orleans. “Some Account of the Hot Springs of Arkansas.” *New Orleans Medical and Surgical Journal*, November, 1860.

Dr. Cartwright was the recipient of several medals, particulars regarding which have as yet eluded me. He will be again referred to under Section X., Yellow-fever, Diphtheria, and Phthisis.

Dr. Gerard Jan Mulder (1802–80), of Utrecht, Holland. “Commentatio de aquis Rheno-Trajectinis,” etc. *Trajectum ad Rhenum*, 1824, 8°.

Dr. Mulder’s medal was described under Section X., Cholera (No. 993).

Dr. Henri Joseph Rega (1690–1754), of Louvain, Belgium. “Dissertatio medicalis de aquis mineralibus,” etc. *Lovanii*, 1740, 16°.

1718. Obverse. Bust to left. No inscription.

Reverse. Henri Joseph | Rega, | Né A Louvain | Le
XXVI Avril MDCXC. | Y Mourut | Le XXII Juillet |
MDCCLIV. Silver. 40 mm.

Kluyskens, Médailles, etc., ii., p. 354, fig.; *ibid.*, *Num. med. belge*, p. 14, No. 8.

This medal is not mentioned by Duisburg, who published subsequently to Kluyskens.

Rega is also commemorated upon Nos. 1309 and 1310, the two medals in 1841 of the Royal Academy of Medicine of Belgium.

In addition to the works mentioned of Dr. Johan Jakob Berzelius, of Stockholm, he published "Nova Analysis Aquarum Medeviensiū," 1800.

Dr. Justus Von Liebig (1803-73), of Munich. "Untersuchung der Mineralquellen," etc. Wiesbaden, 1839, 8°.

1719. Obverse. Bust. Beneath: C. G. K(orn). Inscription: Justus L(iber). B(a)ro De Liebig Medic. Et Philos. D. A. Chem. P. P. O. Monachensis.

Reverse. Within a wreath of oak and laurel, entwining chemical apparatus, Science, irradiated and with a large book in her lap, accepts fruit offered by two kneeling females. Before her, a youth holding a retort. Between his feet, a skull. Legend: Intimam Rerum Aperuit Vim Hominibusque Thesauros Exergue: Korn In Mainz. (Duisburg omits the legend.) Silver, bronze. 52 mm. Kluyskens, ii., p. 156, fig.; Duisburg, p. 172, cccclxiii.

1720. Obverse. Bust to right. Beneath: A. Stanger. Inscription: Justus Liebig.

Reverse blank. Bronze. Duisburg, Suppl. I., p. 8.

There is also a large medallion of Liebig in the Court of Honor of the New Superior School of Pharmacy at Paris.

Dupuy, Notices Biographiques sur les médaillons, etc. Paris, 1881, p. 86.

There are quite a number of additional tokens relating to this subject.

CANADA.

St. Leon (Quebec).

1721. Obverse. Within a circle, a ferocious lion's head, full face. Upon its brow, S^t Leon. Inscription: S^t Leon Mineral Water C^o. Ltd. | Springs At S^t Leon Que(bec).

Reverse. Good | —.— | For One Glass | —.— | S Leon Water. | —.— | 1890 Brass, white metal. 17.

Storer, *American Journal of Numismatics*, October, 1890, p. 39, No. 133. In my collection.

1722. Obverse. Hoerner | One Glass | .St. Leon. | Water | Three Rivers

Reverse plain. Edges milled. Brass. 16. *Ibid.*, No. 132. In my collection.

1723. Obverse. In field, a crown. Inscription: C.E.A. | Langlois.

Reverse. Drink | †St Leon | Water

Edges beaded. Brass. 12.

Le Roux. *Le Medaillier du Canada*, p. 183, No. 973, fig.; Storer, *loc. cit.*, October, 1889, No. 70.

THE UNITED STATES.

1724. There is another soda token of T. Brimelow, of New York. Weyl, *Fonrobert Cat.*, Nos. 3054-59. In my collection.

1725. Obverse. Chamberlain, Bros. | 1 | Glass | * | Soda | Water | ***

Reverse. Large mortar and pestle. Copper. 12. *Ibid.*, No. 5663.

1726. Obverse as above.

Reverse. In addition to the mortar; Perfumeries, etc. Copper. 12.

I have been informed of this by Mr. Edward Groh, of New York.

1727. Obverse. Good (etc.) at Frederick's Pharmacy (etc.) N. Y.

Reverse. Continental Soldier. White metal. 15. *Coin Collectors' Journal*, i., 1876, p. 162; *ibid.*, xii., 1887, p. 106.

1728. Obverse as preceding.

Reverse. Arms, supported by farmer and fisherman, with eagle above. *Ibid.*

1729. Obverse the same.

Reverse. As that of the *Libertas Americana* medal. *Ibid.*

1730. Obverse the same.

Reverse. Liberty Bell. *Ibid.*

1731. Obverse. W. L. Waring Druggist Richmond Va.

Reverse. One Soda etc. Pewter. 14. Frossard, *One Hundred and Fourth Cat.*, January 9th-10th, 1891, No. 941.

IRELAND.

Dublin.

1732. Obverse. Kennan & Co. Aerated Mineral Waters (etc.) (1868.) Battey, *loc. cit.*, i., p. 642, No. 1495.

Newtownards, County Down.

1733. Obverse. Bowman (etc.) Manufacturer of Aerated Waters. Copper. 14. *Ibid.*, i., p. 637, Nos. 1457-58.

In the collection of Mr. Charles H. Wright, of New York.

ENGLAND.

Bath, Somersetshire.

1734. Obverse as in No. 233.

Reverse as in No. 234. In my collection.

1735. There exists an English medal "giving the principal Bathing Places and Towns, and their distances from London." William Till Cat., 1846, Part III., No. 587.

For the London token of the Vichy Water, see under France.

FRANCE.

Lourdes.

In addition to No. 249 there is the following :

1736. Obverse. Within an ornamental curved quadrilateral the Virgin, crowned, and with folded hands. Inscription : N.D.De.Lourdes-Priez Pour Nous

Reverse. The grotto, with Bernadotte Soubirons at prayer. Above, to left, the church ; to right, the Virgin, without crown. Worn by the Sisters of Jésus-Marie and their pupils, in the Parish of Notre Dame de Lourdes, Fall River, Mass.

Vichy.

In addition to No. 248 there are :

1737. Obverse. On scroll above : Ouvert Toute L'Année
Below : Etablissement | Thermal | De | Vichy — Adm^{on} |
* Paris * | Boul^t Montmartre 22

Reverse. Within two circles: ..Cure At Home | .. the
| ... Waters | lin |tes & Co. | Sackville St. | 57

Brass shell, enclosing card. 25. In my collection.

1738. Obverse as the preceding.

Reverse. L'Eau de Vichy | Se Boit Au Verre | à 25 c. |
A L'Entrepôt | de toutes les | Eaux Minérales | Le Havre |
Grand Quai, 17.

Tin shell, with card. 25. In my collection.

GERMANY.

Aschaffenburg, Bavaria.

(251.) I was uncertain about this when previously publishing. It proves to have been in honor of Julius Echter, as Prince Bishop of Wurzburg, and one of a series of similar thalers from 1573 to 1617.

Kohler, *loc. cit.*, ix., p. 301.

Ems, Hesse-Nassau.

1739. Obverse. View of the town. Above: Ems
Reverse blank.

Edges beaded. Copper. 15. In my collection.

1740. Obverse. A mug. Inscription: Kursaal Ems
Reverse. Ein (etc.)

Edges milled. Brass. 14. In my collection.

1741. Obverse. Kursaal | In | Ems | 5 (incused) | S & F.
Reverse blank.

Edge of obverse milled. Brass. 14. In my collection.

Fürth, Bavaria.

1742. Obverse. A clover leaf. Inscription: Gut Für |
Glas Wasser*

Reverse. H.Ratz | Mineral-Wasser | Anstalt | Fürth

Edges milled. Copper. 12. In my collection.

Kissingen, Bavaria.

1743. Obverse. Verwaltung | Des | Königl | Kurhauses
| —.— | Kissingen.

Reverse. $\frac{1}{2}$ | Glas | —.— | Molke (Whey)
Edges milled. Brass. 12. In my collection.

Kreuth, Bavaria.

1744. Obverse. Bad | Kreuth | 1875
Reverse. 5
Edges milled. Brass. 14. In my collection.

Posen, East Prussia.

1745. Obverse. Apotheke zum Weissen Adler In Posen*
| 1 | Glas | Kohlensaur | Wasser | * | J. Jagielski
Reverse. Apteka Pod Bialym Orlen W Poznanin* | 1 |
Szelanka | Wody | Musujacy | * | J. Jagielsik
Edges milled. Copper. 12. In my collection.

Salzungen, Saxe-Meiningen.

1746. Obverse. Mineralwasser | Anstalt | Dr. Hofmann
| — | Salzungen.
Reverse. 1 | Glas | Mineralwasser | $\frac{1}{2}$ Sgr (Silbergroschen).
Edges beaded. Brass. Oval. 12 x 15. In my collection.

Warmbrunn, Prussian Silesia.

(275.) Obverse. View of building. Beneath, 1865.
Reverse. Mitbegründer | Des | Militair | Kurhauses | Zu |
Warmbrunn.
Edges lined. German silver. 14. In my collection. In
previously mentioning it, I was unable to give its description.

Ferdinandsbad.

1747. Obverse. Building. Upon ground, C. Haeseier.
Beneath : Cursaal
Reverse. Ferdinands | bad | 1841. Bronze. 15. In my
collection.

Karlsbad, Bohemia.

1748. Obverse. Carl IV., erect.
Reverse. Wreath and inscription. 500th Anniversary.
1858. Tin. 41 mm. Helbing Cat., No. 4, 1887, No. 2931.

1749. Obverse. The Kurhaus. Exergue : MDCCCLXXIX.
Reverse. Zur | Erinnerung | An Die | Eröffnungsfeier |
Der Neuen | Sprudel Colonade | 1 Juni 1879 Exergue :
Luksch & Söhne Wien-Carlsbad Silver. 37 mm. In my
collection.

Marienbad, Bohemia.

1750. Obverse. Abonnement | *Marienbad*
Reverse blank. Brass. 15. In my collection.

Ratz, Hungary.

1751. Obverse. Oak branches tied by ribbon. Within :
Rátz | Fürdo
Reverse. Within similar branches, Raitzen | Bad Edges
milled. Tin. 12. In my collection.

Teplitz, Bohemia.

1752. Obverse. Head of John Baptist (the city arms).
Reverse. Inscription : 762-1862. Brass. 16.
This medal, which, like the larger one already described,
No. 274, commemorates the eleven hundredth anniversary of
the discovery of the spring, was brought to my attention by
the Messrs Chapman, of Philadelphia.

(*To be continued.*)

WHEN IT IS GOOD TO BE AT HOME.—“ Well, Maggie,”
asked a teacher of a little girl, “ how is it you are so late this
morning to school ?”

“ Please, sir,” was the reply, “ there wis a wee bairn cam’
to oor hoose this mornin’.”

“ Ah !” said the teacher, with a smile ; “ and wasn’t your
father very pleased with the new baby ?”

“ No, sir ; my father’s awa’ in Edinburgh, and dinna ken
about it yet ; but it was a guid thing my mither wis at hame ;
for gin she had been awa’, I wadna hae kent what to dae wi’
it.”

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

MESENTERY CYSTS.—*Gazette Hebdomadaire* of May 31st, 1891, reports the removal of many cysts of the mesentery by M. Terrillon. It is generally very difficult to differentiate between these and cysts of the pancreas; but patients having cysts of the mesentery do not generally suffer from renal disturbance; they are not emaciated, as those who have cysts of the pancreas. Having divided the epiploon, he emptied the cyst by puncture and aspiration, and then tried to remove the tumor, but without success. He has always found it necessary to fasten by suture the sides of the cyst to the abdominal walls and to have recourse to drainage in order to effect a cure.

Three cysts removed by Dr. Terrillon contained a lemon-colored fluid and their cavities were without epithelium.

More frequently the liquid found in cysts of the mesentery is of an undefined color, opalescent, and contains fat, but sometimes the liquid is yellow.

Jules Boeckel, in a work which he has recently published on cysts of the pancreas, gives, as a differential sign between them and those of the mesentery, the almost constant presence of an opaline, viscid liquid containing much fat.

The liquid in the cysts operated on by M. Terrillon seemed to be entirely serous. In these cases the large intestine was found to lie over the cyst so that direct puncture was contra-indicated. M. Terrillon did not puncture until he had opened the abdomen in the median line.

These cysts are almost always extensively adherent to the surrounding parts, and, as a general rule, as in cysts of the pancreas, it is not possible to extirpate them entirely. After having opened them and fixed the sack with suture to the abdominal walls, it is necessary to await the gradual absorption of the abdominal cyst.

VARIATION IN THE FORM OF THE SOLE OF THE FOOT, under the influence of rest, of standing, and of walking, was

the subject of a very interesting communication to the Société de Brologie, by MM. Féré and Demantké.

By examining the imprint of the foot under different physiological conditions, the authors of this communication have demonstrated the modifications of the arch of the foot in walking and in standing erect.

The weight of the body acting on the muscles and the ligaments uniting the bones of the foot tends always to produce flat-foot.

In very young children, they say, the normal arch of the foot is very slight; the articulations are not firm; the bones are flexible, and the weight of the body is out of proportion to the resisting power of the foot. Long standing must, under such circumstances, be a very powerful and a very frequent cause of flat-foot. We may judge from these facts of the injurious effects on the foot, from a hygienic point of view, of the many different apparatuses to teach children to walk, particularly the go-cart, which are intended to keep young children in the erect position and their weight on their feet for a time far beyond the limit which a proper regard for the excessive fatigue of the muscles thus caused would permit.—*Gazette Hebdomadaire*.

EFFECTS OF KOCH'S LYMPH.—Drs. D. A. Esquerdo, D. J. Duran, and D. J. M. Bofill give the following conclusions regarding the treatment of tuberculosis with Koch's lymph, as the result of observations made in the Hospital de Santa Cruz, in Barcelona. The conclusions are found in the *Revista Clínica de los Hospitales* (as taken from the *Revista de Medicina, Cirujia y Farmacia de Barcelona* of April, 1891) as follows:

1. The injections, although always painful, never caused local inflammation.
2. All the patients treated felt the general reaction, accompanied with the symptoms usually characteristic of fever.
3. No severe local symptoms were noted.
4. The remedy possesses no value whatever as a means of diagnosis, so far as the effects were observed on those having tuberculosis, as well as on those not having the disease.
5. The injections are dangerous, since, notwithstanding the

great care taken in regulating the dose, very serious disturbances sometimes resulted.

6. In no case was decided improvement observed ; the greater number of patients remained in the same condition as before treatment, while some became rapidly worse.

7. We reject the inoculations, because they have neither diagnostic nor therapeutic value, and because the febrile reaction does not cure nor even alleviate the severity of the disease.

THE RADICAL CURE OF INGUINAL HERNIA in the female was the subject of a communication to the Société de Chirurgie by M. Lucas-Championnière, which has been reported in the *Gazette Hebdomadaire*. He has performed many of these operations on females who had suffered much from hernias ; he believes that a certain number of the cases were congenital. He operates as follows :

" I dissect very carefully the sack into the abdominal cavity ; the dissection made, I divide the sack without hesitation and the round ligament which, no doubt, becomes attached to the wall. I have never had any unfavorable result from this mode of operating.

" The connection of the sack with the genital organs is very interesting ; the ovary is often within the sack or in its orifice ; it is normal or sclero-cystic or atrophied. I have often removed it.

" Another interesting feature is, that in the female the canal is more distended above than below, so that the suture of the walls of the canal is easily and satisfactorily done, and in a remarkable degree assures the permanence of the cure without bandages.

" One of the most valuable results of the operation is the removal of the pain caused by the hernia. The cure remains complete. In one of my patients, the one in which the hernia descended as far as the knees, the walls closed and withstood, without injury, two periods of gestation and two natural labors. In order to give assurance to the patient, I allow her to wear a belt with a pad, but limit its use to five or six months."

At the next meeting of the Société M. Berger took exception to some of the remarks of M. Lucas-Championnière,

regarding the pathological anatomy and the etiology of these forms of hernia :

“ There are,” he said, “ in the female two kinds of inguinal hernia : one in which the sack is not in immediate connection with the round ligament, is without adhesions, may be very easily separated, for there is no danger, as in the male, of wounding the different parts within the chord—these are the acquired hernias. In the others the round ligament is closely united with a very thin sack, which is very easily torn—these are the congenital hernias.

“ Even in these cases I have always been able to isolate the ligament and to separate it from the pellicle of peritoneum which covers it. However, the preservation entire or the division of the round ligament is of very little consequence.

“ I have not observed the lesions of the neighboring parts so often as M. Championnière ; I have never met the ovary ; I have seen the Fallopian tube sometimes, but I have always found it easy to turn it back into the abdominal cavity and to close the peritoneum quite near the place where the canal was detached.

“ To effect a radical cure, I take great care to carry the dissection of the sack very high up, and to separate at the same time the adjoining peritoneum ; for this reason I divide the anterior wall of the canal very extensively ; I fasten its pedicle high up within the abdominal cavity. I then endeavor to restore the inguinal track by suturing, step by step, and for these sutures I prefer silk to catgut, because it is not so easily absorbed. This restoration of the inguinal canal seems to me to be of the greatest importance.

“ Mr. Championnière thinks that the greater number of hernias are adherent ; he dissects the sack very high up, even to the ligament, and does not fasten the pedicle.”

METASTATIC INFLAMMATION OF THE THYROID was the subject of a communication to the Société de Chirurgie by MM. Kummer, of Geneva, and Taver, of Berne. M. Kummer, says the *Gazette Hebdomadaire*, found it necessary to remove a portion of the thyroid body in a patient during an attack of typhoid-fever and in another during confinement. From the bacteriological researches of Dr. Taver it is evident that in the case of the young girl who had typhoid-fever there

were great quantities of the bacilli of Eberth in the thyroid body, and of streptococci in the same organ in the case of confinement. Besides, M. Marchand has found thyroiditis to result from the presence of pneumococci. These facts strengthen the opinions of Professor Verneuil and Professor Lannelangue regarding the variability of the bacilli capable of producing inflammation and suppuration. Just as there are different kinds of osteomyelitis, having the characteristics of different bacilli, so there are different cases of thyroiditis.

TOLERANCE OF FOREIGN BODY IN THE LARYNX.—A piece of copper which had been swallowed by a child remained nine months in the larynx below the glottis, and was removed by tracheotomy by Dr. Montac, of Grenoble. Tolerance of the foreign body was, no doubt, due during so long a time to obtuseness of the sensibility of the trachea.

PANCROBILIN.—We take pleasure in publishing the following letter :

BEDFORD, O., June 3, 1891.

Messrs. Reed & Carnrick, New York :

GENTLEMEN : Two years ago I took diarrhœa and was treated for it by a number of physicians with only temporary relief. I received some of your pancrobin, and I am happy to inform you that one bottle was sufficient to do the work in my case. It *entirely cured me*, and I have not had a return of the trouble since. My weight was reduced from 175 to 140 ; have now regained my former health and weight. You are at liberty to publish the above over my signature.

Yours truly,

R. R. ANDERSON, M.D.

LACTO-CEREAL FOOD is a new product recently put on the market by Reed & Carnrick, of New York.

It is prepared from milk, cereals and fruit, and is not only palatable, but highly nutritious and easily digested.

Great progress has been made in recent years in making foods to meet various indications. The lacto-cereal food is especially prepared for invalids, the aged, and for convalescents who need a palatable, digestible, perfect food for building up waste tissues at the least possible expense of digestive effort.—*Dietetic Gazette*.

THE PROGRESS OF INFECTIOUS DISEASES AND DEATH RATES AT THE MOST RECENT DATES.

COMPILED BY HARRY KENT BELL, M.D.

ALABAMA.—*Mobile*, 40,000: Reports 64 deaths during May, of which 24 were under five years of age. Annual death-rate, 24.6 per 1000. From zymotic diseases, 9, and from consumption, 13.

CALIFORNIA.—Reports from sixty-six cities, towns, and localities, having a population of 608,945, during May, show 945 deaths to have occurred from all causes. Annual death-rate, 18.60. Deaths from consumption, 140; pneumonia, 91; bronchitis, 21, and congestion of the lungs, 11. Croup and diphtheria caused 46 deaths; typhoid-fever, 20.

San Francisco, 297,990: Deaths during the month of May, 530. From consumption, 79; acute lung diseases, 79; croup and diphtheria, 26; typhoid-fever, 9. Death-rate, 21.00.

Los Angeles, 53,394: Deaths, 68. From consumption, 19; acute lung diseases, 7. Death-rate, 15.3.

Oakland, 50,000: Deaths, 75. From consumption, 5; acute lung diseases, 9.

CONNECTICUT.—Thirteenth Annual Report of the State Board of Health for the year ending November 30th, 1890, together with the Registration Report for the year ending December 31st, 1889. Pp. 327, 196. The first two hundred pages of this volume are taken up with a brief general summary of the work of the Board, abstract of the proceedings of the quarterly meetings, and the health of towns reports by the local health officers; showing that the subjects of greatest attention have been influenza, typhoid-fever, diphtheria, water pollution, and needful sewerage. Next follows the Secretary's report, showing a gratifying degree of progress in the organization and practical work of local boards of health throughout the State. Some so-called "health resorts"

continue to be maintained and patronized by persons in different conditions promotive of sickness. Many others there are, however, clean and healthful. The misfortune is that there are still a great many city people who select their summer resorts as they do their plumbers—give preference to those who promise the most for the least money—and with the same general result—good patronage for physicians.

The Report of a Series of Monthly Analyses of the Water from two Cemetery Wells in New Haven, by Herbert E. Smith, M.D., contains some important suggestions of practical value, though the two cemeteries selected and the (driven) wells, can hardly be considered fair examples of the conditions which commonly prevail in country towns, where the wells are more shallow and not driven, and the cemeteries located with little or no regard to the nature of the subsoil; the inference being, from the premises stated and the results of the analyses, "that a cemetery with a deep sandy soil would be very unlikely to contaminate the ground water at any considerable distance from the cemetery"—a conclusion, in accordance with the conditions stated, too indefinite to be of practical utility.

The Sale of Adulterated Food in Connecticut is shown, in a report by A. L. Winton, Jr., of the Agricultural Experiment Station, New Haven, to be carried on, as a rule, without restriction, notwithstanding there is a general law "to prevent the adulteration of food and other articles." The principal reasons why this law has not been enforced are said to be because public opinion has not demanded it, failure to appropriate funds for enforcing it by the boroughs, towns, and municipalities who have discretionary power in this regard, and that the State chemists are not equipped for making the analyses which the proper enforcement of the law would require. The Experiment Station not being under any legal obligations to do this work, it was undertaken in the autumn of 1890 by the reporter, by the special commission of Dr. Lindsley, Secretary of the State Board of Health. Of 150 samples—of milk, tea, sugar, pepper, mustard, honey, canned peas and other canned vegetables, pickles, maple syrup, and cream of tartar—examined and here reported upon: Of milk, twelve per cent was adulterated; teas (18 samples), all the

green teas examined were found to be "faced" or painted with a mixture of some clayey matter, Prussian blue, and a yellow dye; most of the other kinds of tea contained more or less soapstone dust, clay and other matters, to make weight. Maple syrup—a single bottle labelled, "Improved Maple Syrup"—was a mixture containing glucose and, possibly, molasses or raw sugar. Strained "honey" largely consisted of glucose. Of nineteen samples of mustard, two only were found free from adulteration; of four of pepper, two were adulterated; of twelve samples of cream of tartar, four only were genuine. Nine brands of French peas, one of string beans, and one of mixed vegetables examined were all found to contain copper. Of four jars pickles two contained copper.

In a circular recently sent out by the manufacturers of a well-known milk preservative, the following statement appears:

"We know that many unscrupulous persons have recommended such chemicals as salicylic acid, borax, boracic acid and benzoic acid as proper articles to preserve milk; but a little investigation will show these, by reason of their action on the human system and the health of people, to be unfit for use, and, in fact, quite injurious."

Upon which the reporter remarks: "Since the preparation which this philanthropic company offer for sale consists, according to analyses by reliable chemists, largely of boracic acid, the public, in the light of this quotation, can decide as to the advisability of its use." And yet the reporter fails to publish the names of these manufacturers, as also of those who manufactured and sold the articles found to be adulterated. The public elsewhere, as well as in Connecticut, is left at their disposal.

Registration Report for 1889: Population of the State, 734,000. In seventy-two towns—those chiefly dependent upon agricultural industries—there had been a decrease since 1880, but the decrease is attributed to mere change of residence and business, to a more than corresponding increase in the population of manufacturing towns, so that, on the whole, there has been since 1880 an increase from 622,700—17.8 per cent.

Births, 17,176—birth-rate, 23.4 per 1000; marriages, 5744

—one to every 127.7 of the population ; divorces, 536—one to every 10.7 marriages ; deaths (exclusive of 652 still-born), 12,529—death-rate, 17.07. 2602 (179 less than the previous year), or 20.78 per cent of the total mortality, was caused by zymotic diseases ; diphtheria and croup, 717—161 more than in 1888 ; typhoid-fever, 281—11 less than in the previous year ; whooping-cough, 92—an increase of 16 ; scarlet-fever, 81—an increase of 22 ; measles, 62—an increase of 21.

Consumption and other diseases registered as “tuberculosis,” 1518—26 less than the year previous—12.03 per cent of the total mortality.

According to the Secretary's abstract of reports from 166 towns for May, 1891, there were 1171 deaths reported in the State during the month. This was 89 less than in April ; it was 173 more than in April, 1890, and 235 more than the average number of deaths in May for the five years preceding the present.

The death-rate for the large towns was 15.5 ; for the small towns, 17.4, and 18.8 for the whole State.

The deaths from zymotic diseases were 184, being 15.7 per cent of the total mortality against 12.4 per cent in April.

New Haven, 86,045 : Deaths, 156—under five, 31 ; from zymotic diseases, 15. Death-rate, 19.6.

Hartford, 53,230 : Deaths, 95—under five, 17 ; from zymotic diseases, 10. Death-rate, 17.9.

Bridgeport, 48,866 : Deaths, 90—under five, 19 ; from zymotic diseases, 18. Death-rate, 20.1.

ILLINOIS.—*Chicago*, 1,200,000 : Deaths during the month of May, 2585—1071 under five years of age. Death-rate, 25.85. From zymotic diseases, 770 ; consumption, 212.

MARYLAND.—*Baltimore*, 455,427 : Deaths during May, 892, as against 1012 for the corresponding month of 1890. Of these, 699 were white and 193 colored, a death-rate of 21.84 per 1000 for the former and 32.62 per 1000 for the latter. The death-rate for the whole population was 23.52 per 1000 ; 33 persons died from infectious diseases, 94 from consumption, and 115 from pneumonia ; 296, or 33.2 per cent of the total deaths, were in children under five years of age.

MASSACHUSETTS.—*Boston*, 448,477: During May, 1891, deaths reported, 891, of which number 247 were under five years of age. Annual death-rate per 1000, 23.84. From zymotic diseases, 89, and from consumption, 129. Cases of contagious diseases reported, 578.

MICHIGAN.—The Secretary of the State Board of Health reports that for the month of May, 1891, compared with the preceding month, cholera infantum, cerebro-spinal-meningitis, cholera morbus, inflammation of brain, puerperal-fever, and inflammation of kidney increased, and that membranous croup and diphtheria decreased in prevalence.

Compared with the preceding month, the velocity of the wind was slightly less, the prevailing direction was northeast (instead of west and southwest), the temperature was higher, the absolute humidity was more, the relative humidity was less, the day ozone was more and the night ozone considerably less.

Compared with the average for the month of May in the five years 1886–90, influenza was very much more prevalent, and typho-malarial-fever, whooping-cough, diphtheria, remittent-fever, membranous croup, intermittent-fever, dysentery, and cerebro-spinal-meningitis were less prevalent in May, 1891.

For the month of May, 1891, compared with the average of corresponding months in the five years 1886–90, the velocity of the wind was slightly less, the prevailing direction was northeast (instead of southwest), the temperature was slightly lower, the absolute humidity and the relative humidity were less, the day ozone was more, and the night ozone was slightly less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of May, 1891, at forty-six places; scarlet-fever at sixty-four places; typhoid-fever at seventeen places, and measles at eighty-nine places.

Reports from all sources show diphtheria reported at five places less; scarlet-fever at fifteen places less; typhoid-fever at three places more, and measles at fifteen places less in the month of May, 1891, than in the preceding month.

Detroit, 220,000: During May, deaths, 347—under five

years of age, 71. Death-rate, 18.57. From zymotic diseases, 64 ; from consumption, 33, and from pneumonia, 41.

MINNESOTA.—*Public Health* bulletin for April reports : Total deaths in April, 744, reported up to date (based on over 500 separate returns of deaths). The total, if as complete as for March, would be a little below the average of this month for the last three years.

Measles caused 15 deaths ; double that of last month and increasing.

Scarlatina caused 11 deaths ; a slight increase.

Diphtheria caused 29 deaths ; a decided decrease.

Croup caused 5 deaths ; not one third the average April mortality for three years.

Enteric-fever caused 14 deaths ; a steady decline.

Tuberculosis caused 114 deaths ; about as last month, but less than the April average of three years.

Bronchitis caused 45 deaths ; a decided reduction.

Pneumonia caused 68 deaths ; less than half mortality of March and less than the average of three preceding months, or of April for 1888-90.

St. Paul, 150,000 : Deaths during May, 133—48 under five years of age. Deaths from zymotic diseases, 19 ; from consumption, 13. Death-rate, 10.65.

MISSOURI.—*St. Louis*, 460,000 : Deaths during May, 686—under five years, 230. Death-rate, 17.8. From zymotic diseases, 102, and from consumption, 82.

NEW JERSEY.—*Hudson County*, 283,850 : Deaths during May, 622—under five years, 388. From zymotic diseases, 98 ; from consumption, 72. Death-rate, 26.3.

Paterson, 78,358 : Deaths during May, 200—75 under five years of age. Death-rate, 24.7. Deaths from zymotic diseases, 37 ; from consumption, 17.

NEW YORK.—The Secretary of the State Board reports that the mortality in the State for May is 10,213, or 330 deaths daily ; there were 133 fewer deaths each day than in April, but the mortality is greater than that of the preceding

months of the year by about 20 deaths daily ; and is greater than that of May, 1890, by 50 deaths daily. There has been a continuance of influenza (*la grippe*), but it has much abated ; deaths from acute respiratory diseases have diminished by 2228 from the preceding month, but there were 600 more than in last May ; there were 300 fewer deaths from nervous diseases ; 300 fewer from old age ; 100 fewer from diseases both of the circulatory and urinary systems ; the unclassified deaths are also lower. Compared with the average of the past six years for May, the percentage of deaths from acute respiratory diseases alone is greater, being 20.8 to 16.3 ; from nervous, circulatory, and other local diseases, and also from consumption, the proportion of deaths is less than the average, rather than greater. The actual mortality from diseases of the zymotic class was 1200 ; in April, 1300 ; in May, 1890, 1100. Measles is the only disease of this class which shows any increase over last month ; but scarlet-fever has a considerably greater mortality than a year ago. The death-rate for the State (5,600,000 population reporting) is 21.50 per 1000 ; from zymotic diseases, 2.52 ; of deaths under five years of age, 6.25. In April the death-rate was 30.00 per 1000 population. The lowering of the death-rate has taken place uniformly, in the rural as well as the urban districts.

New York, 1,680,796 : Total deaths, 3692—1390 under five years. Death-rate, 25.86. Zymotic diseases per 1000 deaths from all causes, 149.57. Deaths from consumption, 478.

Brooklyn, 862,155 : Total deaths, 1651—604 under five years. Death-rate, 32.05. Zymotic diseases per 1000 deaths from all causes, 142.42. Deaths from consumption, 201.

Albany, 100,000 : Total deaths, 179—31 under five years. Death-rate, 21.48. Zymotic diseases per 1000 deaths from all causes, 94.45. Deaths from consumption, 20.

Syracuse, 88,000 : Total deaths, 134—26 under five years. Death-rate, 18.29. Deaths from zymotic diseases per 1000 deaths from all causes, 60.00. Deaths from consumption, 22.

Buffalo, 255,000 : Total deaths, 487—142 under five years of age. Death-rate, 32.89. Deaths from zymotic diseases per 1000 deaths from all causes, 86.50. Deaths from consumption, 41.

Rochester, 138,327 : Total deaths, 201—41 under five years

of age. Death-rate, 17.39. Deaths from zymotic diseases per 1000 deaths from all causes, 110.00. Deaths from consumption, 24.

OHIO.—*Monthly Sanitary Record* for May gives abstract of reports of deaths and causes, seventy-eight cities and towns, during the month of April, in part as follows :

Cincinnati, 296,908 : Deaths, 610—under five years, 171 ; from zymotic diseases, 92 ; croup and diphtheria, 16 ; typhoid-fever, 23. From consumption, 59 ; pneumonia, 98. Death-rate, 24.66.

Cleveland, 261,353 : Deaths, 642—under five years, 205 ; from zymotic diseases, 79 ; croup and diphtheria, 23 ; typhoid-fever, 11 ; whooping-cough, 5. From consumption, 60 ; pneumonia, 158. Death-rate, 29.47.

Columbus, 88,000 : Deaths, 120—30 under five years ; from zymotic diseases, 12—croup and diphtheria, 3. From consumption, 21 ; pneumonia, 13. Death-rate, 16.45.

Dayton, 61,220 : Deaths, 72—under five years, 26 ; from zymotic diseases, 13—croup and diphtheria, 7. From consumption, 8 ; pneumonia, 7. Death-rate, 14.11.

Toledo, 81,434 : Deaths, 117—under five years, 39 ; from zymotic diseases, 14—croup and diphtheria, 7. From consumption, 9 ; pneumonia, 19. Death-rate, 17.24.

RHODE ISLAND.—Reports from medical correspondents covering all sections of the State indicate that for the month of May the influenza, or *la grippe*, continued to be the most prevalent form of disease, excepting towns bordering on the lower Narragansett Bay, not only as the sequelæ of the same disease in April, but also in the occurrence of new cases.

Bronchitis was reported as the next most prominent form of disease in a large proportion of the towns, although that disease, with pneumonia and other diseases of the respiratory organs, had diminished slightly in numbers, but not in general severity.

Compared with the preceding month, diphtheria, typhoid-fever, and scarlatina had slightly increased in area of prevalence, but of mild form and sporadic, scarlet-fever only,

having increased in numbers in Providence, East Providence and vicinity.

Compared with the previous month, the amount of general sickness varied considerably in the different towns, but taking the State at large the amount would seem to be about the same.

Measles had quite large prevalence in the vicinity of Kingston and Valley Falls.

Malarial fevers were also quite prevalent along the Blackstone and Woonasquatucket rivers.

No report of an epidemic prevalence in any locality of any contagious or infectious disease, except influenza.

Compared with the corresponding month in 1890, influenza, typhoid-fever, and malaria had a larger area of prevalence in May, 1891, and measles and whooping-cough a smaller area of prevalence. The last-named diseases were epidemic in several localities in May, 1890.

The number of deaths recorded in the different towns and cities, from which returns have been received, was 482. The towns making returns represent a population (on the basis of the census of 1890) of 305,137. Annual death-rate upon the estimate given is 18.12 in every 1000 of the population.

WISCONSIN.—*Milwaukee*, 230,000 : Deaths reported during May, 388—98 under five years of age. Death-rate, 20.24. Prevailing causes of death : Pneumonia, 59 ; convulsions, 21 ; bronchitis, 29 ; diphtheria and croup, 35 ; consumption, 32 ; influenza, 10.

MORTALITY STATISTICS ABROAD.

During the quarter year ending March 31st, 1891, the population, number of deaths, and death-rates of the principal foreign cities were as follows : London, 4,492,707 ; 25,268, 22.5 ; Liverpool, 620,443 ; 3535, 22.8 ; Glasgow, 532,282 ; 4136, 31.1 ; Birmingham, 506,325 ; 2616, 20.7 ; Manchester, 469,003 ; 3580, 30.4 ; Leeds, 370,261 ; 2231, 24.1 ; Dublin, 353,082 ; 2654, 30.1 ; Sheffield, 338,543 ; 1872, 22.1 ; Edinburgh, 275,436 ; 1500, 21.8 ; Nottingham, 252,217 ; 1140, 18.1 ; Salford, 251,021 ; 1514, 24.1 ; Bradford, 246,101 ; 1198, 19.5 ; Bristol, 235,171 ; 1425, 24.2 ; Belfast, 234,822 ;

1569, 26.8 ; Hull, 219,812 ; 1051, 19.1 ; Newcastle, 165,016 ; 1051, 26.0 ; Portsmouth, 144,671 ; 873, 24.1 ; Brussels, 482,158 ; 3054, 25.3 ; Amsterdam, 406,302 ; 3069, 30.2 ; Rotterdam, 203,486 ; 1425, 28.0 ; La Hague, 156,497 ; 855, 21.9 ; Paris, 2,260,945 ; 15,574, 27.6 ; Lyon, 401,930 ; 2886, 28.7 ; Marseilles, 376,143 ; 3544, 37.7 ; Nantes, 127,482 ; 981, 30.8 ; Saint-Étienne, 117,875 ; 904, 30.7 ; Le Havre, 112,074 ; 849, 30.3 ; Rouen, 106,496 ; 1123, 42.2 ; Roubaix, 106,456 ; 731, 29.1 ; Rheims, 97,903 ; 652, 26.6 ; Nancy, 85,579 ; 666, 31.1 ; Amiens, 80,288 ; 554, 27.6 ; Nice, 78,482 ; 713, 36.3 ; Limoges, 68,497 ; 615, 35.9 ; Besançon, 56,511 ; 430, 30.4 ; Saint-Quentin, 46,746 ; 271, 23.2 ; Charleville, 16,616 ; 114, 27.5 ; Berlin, 1,604,725 ; 7818, 19.5 ; Hamburg, 591,647 ; 3407, 23.0 ; Leipzig, 362,933 ; 1670, 18.4 ; Munich, 345,000 ; 2406, 27.9 ; Breslau, 324,143, 2286, 28.2 ; Cologne, 280,000 ; 1825, 25.4 ; Dresden, 279,585 ; 1288, 18.4 ; Frankfort, 182,818 ; 930, 20.3 ; Hanover, 165,830 ; 824, 19.9 ; Königsberg, 162,318 ; 945, 23.3 ; Düsseldorf, 149,301 ; 855, 22.9 ; Nuremberg, 147,663 ; 923, 25.0 ; Altona, 146,778 ; 1031, 28.1 ; Chemnitz, 142,124 ; 1022, 28.8 ; Stuttgart, 141, 262 ; 679, 19.2 ; Elberfeld, 128,084 ; 678, 21.2 ; Bremen, 125,703 ; 637, 20.3 ; Dantzig, 119,722 ; 811, 27.1 ; Barmen, 117,725 ; 557, 18.9 ; Aix-la-Chapelle, 103,265 ; 632, 24.5 ; Mayence, 73,761 ; 396, 21.5 ; Vienna, 822,176 ; 6959, 33.9 ; Buda-Pesth, 463,017 ; 3486, 30.1 ; Prague, 314,425 ; 1958, 24.9 ; Trieste, 160,092 ; 1325, 33.1 ; Lemberg, 123,833 ; 1012, 32.7 ; Brünn, 94,384 ; 822, 34.8 ; Cracovie, 76,393 ; 620, 32.5 ; Debreczin, 57,308 ; 438, 30.6 ; Presbourg, 49,269 ; 438, 35.5 ; Copenhagen, 312,387 ; 1669, 21.4 ; Stockholm, 232,284 ; 1741, 20.6 ; Gothenbourg, 105,000 ; 439, 16.7 ; Christiania, 143,600 ; 707, 19.7 ; Helsingfors, 58,446 ; 508, 34.8 ; St. Petersburg, 978,309 ; 7297, 29.8 ; Moscow, 753,469 ; 6452, 34.3 ; Warsaw, 455,852 ; 2583, 22.7 ; Odessa, 276,300 ; 1697, 24.6 ; Milan, 418,972 ; 3589, 34.0 ; Rome, 418,217 ; 3292, 31.5 ; Turin, 314,827 ; 1978, 25.1 ; Geneva, 191,067 ; 1524, 31.9 ; Venice, 156,515 ; 1313, 33.6 ; Bologne, 139,779 ; 1064, 30.4 ; Madrid, 482,816 ; 5024, 41.6 ; Barcelona, 272,000 ; 2921, 43.0 ; Bucharest, 206,000 ; 1454, 28.2 ; Jassy, 82,767 ; 636, 30.7 ; Calcutta, 433,219 ; 3964, 36.6 ; Madras, 398,777 ; 3620, 36.1 ; Havana, 200,000 ; 1654, 33.1 ; Buenos Ayres, 562,864, 3313, 23.5.

SMALL-POX ABROAD.

During the three months ending March 31st, 1891, the deaths from small-pox in foreign cities were as follows : London, 3 ; Glasgow, 1 ; Bristol, 1 ; Belfast, 1 ; Brussels, 140 ; Paris, 21 ; Lyons, 8 ; Marseilles, 190 ; Saint Étienne, 16 ; Roubaix, 9 ; Nice, 3 ; Besançon, 3 ; Vienna, 109 ; Prague, 20 ; Lemberg, 1 ; Brünn, 7 ; Debreczin, 1 ; Copenhagen, 6 ; St. Petersburg, 76 ; Moscow, 10 ; Warsaw, 37 ; Odessa, 2 ; Milan, 2 ; Rome, 1 ; Turin, 1 ; Venice, 9 ; Madrid, 412 ; Barcelona, 58 ; Havana, 6 ; Calcutta, 8 ; Madras, 49.

THE SANITARY SITUATION IN FRANCE was the subject of a communication to the Comité Consultatif d'Hygiène Publique de France, by M. H. Monod, Director of Public Charities and of Public Health, recently, of which the following is an abstract from the report in *Progres Medical* :

At Moulins an epidemic of variola has raged from April to June, 1891. It was introduced by a travelling merchant, and eighteen cases have been treated in the hospital, of which number six died.


The municipal authorities have decided to publish a monthly report regularly from June 1st, 1891, giving the statistics of public health.

Since the fatal case of *cholera* reported on May 22d, at Aleppo, the sanitary condition of the provinces of the Ottoman Empire have generally been good. However, two telegrams of June 1st and 2d announce the existence of a severe epidemic, and as reported very contagious in the Caza of Haram, two days' journey from Aleppo ; it is feared that it is cholera. On the advice of the sanitary authorities the grounds on which the passengers of the *Sculpta* had encamped at Camaran have been condemned—that is, forbidden to be occupied again this season.

Cholera is again reported in Spain, says the *Correio Medico*, of Lisbon, causing considerable anxiety in Valencia, though, as usual, the official press denies it. Yet it is gratifying to notice that the authorities at Madrid have taken steps to check its progress.

EDITOR'S TABLE.

REMOVAL.—A. N. Bell, M.D., the editor hereof, has changed his residence from 113A Second Place to 291 Union Street, Brooklyn.

 ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, Brooklyn, N. Y.

THE TRUTH ABOUT VACCINATION.—In the continued default of any further communication from Dr. GUNN, promised for June number, attention is invited to ALFRED RUSSELL WALLACE, LL.D., D.C.L., F.R.S., and THE ROYAL COMMISSION ON VACCINATION, on other pages of this number.

THE IMPROVEMENTS IN THE NEW YORK QUARANTINE are reported by Dr. William M. Smith, Health Officer of the Port, to be so far advanced as, seemingly, to render the service more facile and more effectual than at any previous period in the history of the establishment.

“The value of this improvement cannot be appreciated except by those who had charge of Hoffman Island while the cholera-infected immigrants were detained there in 1887. The pine floors of the dormitories, embracing an area of 66,856 square feet, on which more than 2000 gallons of a solution of mercuric chloride were used in 1887 to destroy the contagion of cholera, which the floors might otherwise have retained by absorption, have been rendered impervious and non-absorbing by a covering of asphalt.

“The four sections of the south building have been so arranged that the occupants of each section may be isolated from every other section and yet have access to fresh air, dining-tables, and closets.

“The sixty-eight metallic bath tubs which are located on one side of the vestibule at each end of the dormitories, are connected with water tanks in the upper part of the buildings. They afford a refreshing contrast to the fifty or more half barrels used for bath tubs on former occasions. The 720 canvas-covered-double-tired-galvanized-iron-folding bunks, which are triced up against the walls and supporting pillars when

not in use, will be a great improvement on steerage mattresses laid upon the floors, as they have been in time past. Canvas bottoms laced upon the rails take the place of the vermin-filled mattresses. After use the latter were generally destroyed, on account of the difficulty of cleansing them. The canvas bunks now in use, like the hammock of the sailor, can be quickly removed, folded, cleansed in the disinfecting-room, and when replaced be as good for further use as when new.

"The emergency hospital, consisting of several rooms and twenty beds, which have been arranged above the boiler-room in the old administration building, will supply a much-needed convenience for immigrants who are suddenly taken ill while detained for observation. The rooms are isolated from the superintendent's rooms, although in the same building with them. This hospital affords an agreeable contrast to those improvised in the wash-rooms of the dormitories for the cholera-stricken immigrants of 1887.

"The new two-story administration building, each floor of which has an area of 5559 square feet, has several times during the past year been tested in respect to its usefulness for which it was intended, and has fully answered the expectations of those who designed it.

"The 1538 steerage passengers that have been under observation at Quarantine during the past year, for fifty-five days in the aggregate, have afforded the occasion of testing to a considerable extent the serviceableness of the improvements made in connection with that building.

"The dining-rooms of this building will seat several hundred passengers; an extensive kitchen is adjacent to the dining-rooms, with range, steam-heated kettles and boilers sufficient to cook for a thousand people. The store-rooms in connection with the kitchen are ample to contain supplies for the same number.

"A large laundry on the same floor, with stationary tubs, each furnished with hot and cold water faucets, clothes racks and steam drying coils supply every needed facility for securing cleanliness. Formerly the sea constituted the immigrants' wash tub and supplied the water, the sea-bathed rocks around the island their wash boards, and the rip-rap walls their drying racks.

"Along the east side of the old, and on the north side of the new administration building, thirty-two wash basins have been provided, each supplied with a cold and hot water faucet, and are supported over wash troughs, that connect with waste pipes; the lids are closed and locked when not in use.

"The annex closets, forty-eight in number, are set over porcelain-lined troughs, which have an incline of one-fourth

inch to a foot to the sewer end ; when it is necessary to disinfect the dejecta, as it would be if cholera-infected immigrants were under observation, a valve is arranged which will close the opening into the sewer until that object has been effected.

“ Experience in the detention of passengers for observation who have been exposed to some contagious diseases, particularly cholera, shows the necessity for dividing them into groups, having reference to the greater or less extent of their exposure or liability to the disease. This division is of little use if the isolation of the group is not complete under all circumstances. The annex closets in each dormitory accommodate four groups, or the occupants of four sections, each of which is isolated from the others by galvanized iron partitions. Iron reservoirs in the upper part of the dormitory afford an ample supply of sea water for flushing the closets.

“ The portable iron partition across the island, from the head of the slip to the rip-rap wall on the east side, is erected midway between the north and south dormitories, which, when necessary, prevents any communication between the occupants of the dormitories. At other times intercourse is uninterrupted between the buildings, by doors at the east and west ends of the partition.

“ The need of such an arrangement in 1887, when two steamers were in Quarantine, each with several hundred infected immigrants, compelled the detention of the last arrived steamer for some time, for want of a Quarantine of Observation, to the great discomfort and danger of the passengers, who had already been nineteen days in a crowded steerage. The necessity for the agents of the detained steamer to fulfil their charter obligations finally compelled them to charter a ship and fit it up for the reception of the immigrants on board the steamer, at several thousand dollars expense to the company.

“ *The disinfecting plant* is composed wholly of iron and is located in the second story of the new administration building above the boilers and pumps.

“ The disinfecting-rooms are made as nearly air-tight as possible. The ceilings and partitions are made of three-sixteenths iron, well lapped and riveted, caulked and thoroughly fitted. The ceiling, floors, and partitions are lined with iron, and with doors of the same in partitions and for shutters to windows. The doors and room are calculated to withstand the pressure of seven and one half pounds per square inch. The partitions are secured in place by four-inch beams and angle irons, held in place by bolts and rivets bolted to the beams. Each door dividing the sections are hung and set in such a manner as to be perfectly air-tight when closed. The

window shutters are made and hung the same as the doors ; all have rubber stops.

" One hundred and eight galvanized iron baskets of No. 14 wire and one-inch mesh are in position for use. Each with sufficient capacity for the baggage of one person or one family ; or, more exactly, each basket is six and one half to four and one half feet long, frame in wire with stiffening bands. Each series or set of three baskets is suspended and run on the same overhead tracks, so arranged as to slide out their full length.

" Gauges and thermometers are so placed as to indicate the pressures and temperatures of the disinfecting-rooms. For this purpose are used three high ranged thermometers, three vacuum gauges, and three pressure gauges, each having necessary valve and pipe connections with dial boards and fixtures complete.

" A drying-room 109 by 51 feet for baggage and clothing after it is disinfected is connected with the disinfecting chamber by a short hall, in which a small railway and car is to be constructed, to carry the basket from the disinfecting-room to the drying-room.

" *First Test of the Steam Disinfecting Plant*—September 19th, 1890—Anthrax bacilli and anthrax spores were used ; four gelatine culture tubes of the former and two of the latter were placed in the interior of steorage mattresses ; these were rolled up, tied together and put in the baskets of the sections. The vacuum pump was started at 1.24 P.M., the pump exhausting all three sections at the same time. At thirty-five minutes past 1 o'clock the vacuum gauge indicated five pounds pressure. The vacuum pump was then stopped and moist steam introduced into all sections at a steam pressure of 87 pounds. At 2 P.M. the boiler gauge indicated 100 pounds steam. At 1.45 the pyrometer reached 232° Fahr. Moist steam was then shut off, and dry heat maintained for thirty minutes longer.

" The steam pressure within the sections showed that the doors of the middle section were defective in their fastenings.

" A thermometer placed in a mattress and rolled together indicated 228° Fahr.

" Four tubes with live anthrax in gelatine, and two with anthrax spores in the same culture, placed inside of mattresses, rolled and firmly tied together, were entirely sterilized.

" *Second Test*—March 7th, 1891.—The doors that were insufficiently secured on trial September 19th, 1890, having been improved, the disinfecting plant was again tested with boiler pressure at 100 pounds. The three sections were closed and tested at the same time. Anthrax bacilli and

spores, each in glass tubes, closed with sterilized cotton, were placed inside of ordinary steorage mattresses, and the mattress rolled up and firmly tied. The same class of germs, anthrax and spores, one culture tube for each, were put in several blankets, such as are commonly used by immigrants in the steorage, and folded so that each tube was wrapped in six or eight thicknesses of blankets. These were placed in the centre of the sections, midway between the heating coils at the end of the sections. A thermometer was hung in the centre of the middle section. Six minutes after the vacuum pump was started the vacuum gauge indicated the desired exhaustion of air from the sections. The vacuum was maintained fifteen minutes, when live steam was introduced at 100 pounds. In one hour and thirty minutes the index hand of the pyrometer gauge of the middle section made connection with the indicator, set at 230° Fahr., and rang the bell in the engineer's room. The steam gauge on the sections indicated two pounds pressure at this time. The low temperature of the iron walls of the sections, and of the brick walls which were in immediate connection with them externally, when steam was introduced, increased the time in reaching 230° of heat fully one half. Each of the sections have an interior superficial area of 1511 square feet and an aggregate area of 5535 square feet. The iron which encloses this area constitutes a considerable mass of metal to warm up before the heat of the interior can be raised to a disinfecting point. Sections 1 and 3 are end sections; they did not reach a disinfecting heat until one and one half hours after the middle sections reached 230° Fahr.

“These sections are enclosed on three sides by brick walls and are in close connection with them. For this reason the heat was considerably longer in reaching 220° Fahr. than the middle section was in reaching 230° Fahr.

“The thermometer which hung in the middle of the second section indicated a heat of 230° Fahr. The effect of the brick wall, through which the arm of the pyrometer passes to reach the section, and into which it projects four inches, in lowering the temperature by conduction of heat from that portion of the section in contact with the wall, is shown by the difference in the heat as indicated by the pyrometer (230°) and the thermometer (253°). When the first tests were made and the thermometers were hung by the side of the pyrometer, there was a variation of but one degree in the instruments.

“To secure a disinfecting heat quickly when the sections are cold this trial indicates the necessity of heating the disinfecting chambers by dry heat, long enough before moist steam is admitted for disinfecting, to raise the temperature

somewhat of the great mass of iron enclosing the sections and thus to some extent warm the walls adjacent to the sections.

"The following note from the bacteriologist shows that the tests made March 7th were successful in destroying the most resisting disease germs known :

"HOAGLAND LABORATORY, BROOKLYN, N. Y., March 26, 1891.

"*Dr. William M. Smith, Health Officer, Port of New York, Quarantine, Staten Island.*

"DEAR SIR: As the result of the bacteriological tests of the disinfection plant on Hoffman Island, made September 19th, 1890, and March 7th, 1891, respectively, it gives me pleasure to state that the disinfection was thoroughly effective in each instance, totally destroying the vitality of anthrax, both in dried blood and in old dried-out agar cultures containing an abundance of spores. The control cultures grew in every instance, while those subject to the process were, without exception, killed.

"Yours very truly,

"GEORGE T. KEMP, M.D., PH.D.,

"Associate Director."

"THE ARNO."

The selection of the Hotel Arno, Washington, D. C., as the headquarters of the Section on Obstetrics and Gynecology of the American Medical Association in May last, and the admirable accommodations it provided, have led to its choice by other scientific bodies—the American Society of Microscopists holding its annual meeting there in August, and the American Climatological Association, at its forthcoming session during the Second Triennial Congress of American Physicians and Surgeons in that city, in September.

The convenient site of the Arno on Sixteenth Street, between I and K streets, immediately north of the White House, its vicinity to the public halls and clubs, its accessibility by street cars and herdics from both railway stations, while located in the heart of the quiet and fashionable West End, on one of the widest of Washington's most beautiful avenues and between two of its handsome parks, make it one of the most desirable resorts for persons attending the various national organizations which are coming to the national Capital as their appropriate centre.

Originally constructed rather as an apartment house or

family hotel, like The Portland and The Richmond, than as a hotel for transient visitors, additions have been made to it from time to time, during the past six years, until it has become the most complete and elegantly appointed establishment of the kind in Washington, having two hundred spacious rooms for guests, a number of beautifully decorated and attractive dining-rooms, and several large reception rooms available for society or committee meetings. The owner and proprietor, Mr. W. E. Prall, one of Washington's wealthy, enterprising citizens, has expended over half a million dollars in its equipment and decoration. In June of this year Mr. William A. Woods, formerly of The Hamilton and The Shoreham, assumed its management and intends conducting it on both the American and European plans, the latter being of especial convenience to those members of societies and associations to whom "dining out" is an every-day occurrence.

AMERICAN MEDICAL TEMPERANCE ASSOCIATION.—At the close of the recent meeting of the American Medical Association in Washington, on the 8th ult., an association was organized for the promotion of temperance, to be known as the American Medical Temperance Association. With great fitness Dr. N. S. Davis, of Chicago, was chosen President. Dr. F. E. Joakum, Shreveport, La.; Dr. Jonathan Taft, Cincinnati, O.; and Dr. Joseph B. Whiting, Janesville, Wis., were made Vice-Presidents, and Dr. Crothers, of Hartford, Conn., Secretary.

The committee appointed to draft a constitution and by-laws submitted its report, which was unanimously adopted.

The objects of the Association are to advance the practice of total abstinence in and through the medical profession, and to promote investigation as to the action of alcohol in health and disease.

Members are not required to sign any pledge, and if such for any reason cease to be total abstainers, it is expected that notice of withdrawal from the Association will be sent to the Secretary. The liberty of members in prescribing alcohol as a medicine is entirely uncontrolled.

A membership fee of \$1 was agreed upon. All questions involving personal character and eligibility to membership are to be referred to the judicial council.

LITERARY NOTICES AND NOTES.

FUNDAMENTAL PROBLEMS : THE METHOD OF PHILOSOPHY AS A SYSTEMATIC ARRANGEMENT OF KNOWLEDGE. By Dr. PAUL CARUS. Second Edition, Enlarged and Revised. Pp. 372. Price, \$1.50. Chicago : The Open Court Publishing Co.

This book, like other works by the same author, reviewed in previous numbers of THE SANITARIAN, is not only of interest to the students of philosophy, *per se*, but to all who would gain knowledge of the scope of man's nature, viewed from a thorough study of his organization and endowments, as opposed to mere materialistic structure and temporary existence. *Monism* is its leading thought, and toward it all the powers of the author trend, but comprising a knowledge of such factors of human existence as is well calculated to elevate the standard of man's relations to all other organic structures and to show his worthiness of eternal life, whether on the philosophy of monism or otherwise. And however much one may differ with the author, with regard to his ideal of philosophic thought in its religious sense, the "problems" are presented with such respect to those who disagree with him, and so logically, as to render their reading in the highest degree entertaining and necessary to all who would keep abreast with philosophic thought generally, now making its appeal to human intelligence.

LECTURES ON TUMORS FROM A CLINICAL STANDPOINT. FOR THE USE OF STUDENTS. By JOHN B. HAMILTON, M.D., LL.D., Professor of Principles of Surgery and Clinical Surgery, Rush Medical College, and in the Chicago Policlinic ; formerly Supervising Surgeon-General United States Marine Hospital Service, Professor of Surgery in Georgetown University, Surgeon to Providence Hospital, etc. "The Physicians' Leisure Library Series." Issued monthly. 25 cents a copy ; \$2.50 a year. George S. Davis, Publisher, Detroit, Mich.

This is a valuable addition to "The Physician's Library," for the use of students, and particularly so for being a sten-

ographic report of the author's "lectures as they were delivered ; and, as the colloquial form has thus been preserved, it is thought to bring a little relief to the hard-and-fast lines in which articles on tumors are usually cast." It contains the gist of a subject in such a form as to make it especially commendable to medical students, while the busy physician will not fail to find it a useful handbook.

POTABLE WATER : AN ELEMENTARY HANDBOOK. By FLOYD DAVIS, M.Sc., Ph.D., Professor of General and Applied Chemistry in Drake University, Chemist of Iowa State Board of Health, Member of American Association for Advancement of Science, Member of American Public Health Association, Member of American Institute of Mining Engineers, Member of Wisconsin Academy of Science, Arts, and Letters, and Fellow of Iowa Academy of Sciences. 12mo. Price, \$1. Silver, Burdett & Co., Publishers, New York, Boston, Chicago.

Health officers and others will find this to be a practical work of much utility in designating the qualities common to pure water and, *per contra*, impure, together with a description of the common impurities and the means of detecting them. It also discusses under separate chapters, Water Supplies, Natural Purification, Artificial Purification, and Systems for Central Purification. Appended is a brief sketch of the Origin and Home of Cholera, and four simple *qualitative* tests for impurities in drinking water.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS for June contains : Influenza Associated with Nervous and Mental Diseases, by Dr. Van Deventer ; Technic of Ling's System of Manual Treatment as Applicable to Surgery and Medicine, by Arvid Kellgsen, M.D. ; Antipyresis, by Professor Dr. Arnaldo Cantani ; Some Urinary Disorders Connected with the Bladder, Prostate, and Urethra, by Reginald Harrison, F.R.C.S. \$10 a year ; \$1 a copy. William Wood & Co., New York.

THE NEW ERA IN RUSSIA. By Colonel CHARLES A. DE ARNAUD, author of "Ancient and Modern Philosophy," "In Defence of Russia," "The Union and its Ally, Russia," etc. New York : J. S. Ogilvie.

A pamphlet of one hundred and sixty-six pages, containing much information, apparently from authentic sources, with regard to the alleged cruelties of the Russian Government to "Nihilists," stories about the treatment of "Siberian exiles," and the persecution of the Jews, which people should read before giving credence to Stepniak's and other anarchists' statements promulgated by the *London Times*, and reproduced in various phases in this country. Stepniak and Most are evidently of the same stripe.

A PLEA FOR PUBLIC BATHS, TOGETHER WITH AN INEXPENSIVE METHOD FOR THEIR HYGIENIC UTILIZATION. BY SIMON BARUCH, M.D., Physician to the New York Juvenile Asylum, Manhattan General Hospital, and Montefiore Home for Chronic Invalids.

A brochure of forty-five pages, reprint from the *Dietetic Gazette*, May, 1891, which deserves the widest possible distribution. It comprises a lucid sketch of the value of cleanliness, the special benefit of public baths, together with suggestions for their improvement and general adaptation, by such economical, yet thoroughly efficient means as should lead to their speedy adoption in all populous communities.

EXPERIENCE WITH EGG PLANTS, AND THE PRODUCTION AND CARE OF FARM MANURE: Bulletins 26 and 27, Cornell University Agricultural Experiment Station, are of value to all agriculturists and gardeners.

SANITARY IMPROVEMENT IN NEW YORK DURING THE LAST QUARTER OF A CENTURY is the subject of an article by General EMMONS CLARK in the July *Popular Science Monthly*. General Clark knows whereof he writes, having been Secretary of the New York Board of Health during the whole twenty-five years that it has been in existence on a scientific basis.

THE USE OF WATER IN LONDON.—One does not find any period in the history of London when the citizens desired plain cold water as a beverage. Beer was always the national drink—they drank small ale for breakfast, dinner, and supper; when they could get it they drank strong ale. Of water for

washing there was not at this period so great a demand as at present. At the same time it is not true to say, as was said a few years ago in the House of Commons, that for eight hundred years our people did not wash themselves. All through the Middle Ages the use of the hot bath was not only common but frequent, and in the case of the better classes was almost a necessity of life.—*Walter Besant, in Harper's Magazine for July.*

LIFE IN THE OPEN AIR AND ADVENTURES AFLOAT AND ASHORE make up a large part of the *Cosmopolitan Magazine's* contents for July. Trout Fishing in the Laurentides, the Diamond Fields of South Africa, Ostrich Farming in California, and Country Life in Honduras are descriptive titles of some of these profusely illustrated open-air papers. In addition, Elizabeth Bisland describes London Charities in a paper illustrated from picturesque photographs and character studies; C. C. Waddle tells the history of the Woman's Christian Temperance Union; James Grant Wilson writes of the daring achievements of Lieutenant Cushing and General Custer, the boy heroes of the war and navy of the Union; and Lieutenant W. S. Hughes describes the world's progress in the building of submarine war vessels. All these papers are handsomely illustrated from original sources, and in the one on trout-fishing will be recognized the features of an ex-President of the United States.

THE SEWAGE OF PARIS.—Paris, like all other great cities, has been much concerned with the question how to dispose of sewage. At present most of the outflow of the collecteurs pours into the Seine, to its serious pollution. But some years ago the municipality purchased several thousands of acres of land in the plain of Gennevilliers, a few miles down the river, and began the experiment of a sewage farm. The project has been an unqualified success. An extension from the Père-Lachaise-St. Denis collecteur carries a large quantity of sewage to the farm, where it is used by irrigation as a fertilizer, with the best of results in every way. At present one fifth or more of the total sewage effluent of Paris is used on the land at Gennevilliers; and in due time the whole quantity can be

diverted from the river to this and other tracts of land which have been selected as suitable for the purpose.—*Dr. Albert Shaw, in The Century for July.*

AMERICAN CLIMATOLOGICAL ASSOCIATION.

THE eighth annual meeting will be held at WASHINGTON, D. C., September 22d, 23d, 24th, and 25th, 1891, conjointly with the SECOND CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

The Association has selected "The Arno" as its headquarters, located only one square from the Hall of Registration. Terms, \$3 to \$4 per day on the American plan; rooms \$1 upward on the European plan. Members are advised to write immediately for rooms. Address, William A. Woods, Manager, Hotel Arno, Washington, D. C.

Preliminary Programme.

The following papers are already promised. Their order of sequence will appear later.

The Histological Changes which take place in the Lungs in Cured Phthisis and the Influence of Diatheses in the Development of such Changes—Dr. Alfred L. Loomis, New York.

A Study of the Sputum in Pulmonary Consumption—Dr. E. L. Shurly, Detroit.

The Medical Treatment of Pleuritic Effusions. Indications for Aspiration—Dr. G. M. Garland, Boston.

The Surgical Treatment of Acute and Chronic Empyema—Dr. Maurice H. Richardson, Boston.

Nervo-Vascular Disturbances in the Unacclimated in Colorado—Dr. J. T. Eskridge, Denver.

Notes on General *vs.* Local Treatment of Catarrhal Inflammations of the Upper Air Tract—Dr. Beverley Robinson, New York.

The Effects of Climate in the Treatment of Chronic Diarrhœa—Dr. W. W. Johnston, Washington.

The Limitations of Bacteriological Therapeutics, with especial reference to Tuberculosis of the Lungs—Dr. E. P. Hurd, Newburyport.

Further Considerations of the Analysis of Recorded Cases of Phthisis Pulmonalis—Dr. S. A. Fisk, Denver.

The Pre-tubercular Condition—Dr. J. H. Tyndale, New York.

Early Diagnosis and Treatment of Phthisis—Dr. R. C. M. Page, New York.

Early Diagnosis of Pulmonary Tuberculosis and its Importance—Dr. Karl von Ruck, Asheville.

Gymnastic Exercise as a Prophylactic and Remedy in Chest Diseases—Dr. E. O. Otis, Boston.

The Etiological and Therapeutic Relations of the Different Forms of Tubercular Disease to the Climate of High Altitudes—Dr. H. B. Moore, Colorado Springs.

The Climate of the Hawaiian Islands—Dr. T. Munson Coan, New York.

Whooping-Cough and its Management. The Difficulties of Climatic Treatment—Dr. J. H. Musser, Philadelphia.

The Waters of Richfield Springs—Dr. C. C. Ransom, Richfield Springs.

An Experience with Diphtheria at a High Altitude—Dr. W. A. Jayne, Georgetown, Col.

Reports on the late epidemic of Influenza—Dr. John C. Monro, Boston ; Dr. A. Alexander Smith, New York ; Dr. Roland G. Curtin, Philadelphia ; Dr. E. Fletcher Ingals, Chicago ; Dr. Henry B. Baker, Lansing ; Dr. J. C. Mulhall, St. Louis ; Dr. R. J. Munn, Savannah.

The Epidemiology of La Grippe—Drs. R. G. Curtin and E. W. Watson, Philadelphia.

Papers are also promised by Drs. A. Jacobi, New York, S. H. Chapman, New Haven, F. F. Smith, St. Augustine, George H. Rohé, Baltimore, A. S. Garnet, Hot Springs, Beverley Robinson, New York.

It would be a great convenience to the Secretary to have the titles of papers intended to be presented, sent in as early as possible.

The completed programme will be issued, as provided in the constitution, two weeks before the date of the meeting.

Officers of the Association, 1891.

President, Dr. Frederick I. Knight, Boston. Vice-Presidents, Dr. E. L. Trudeau, Saranac Lake ; Dr. F. S. Hopkins, Thomasville. Secretary and Treasurer, Dr. J. B. Walker,

Philadelphia. Council, Dr. F. H. Bosworth, New York ; Dr. F. C. Shattuck, Boston ; Dr. R. G. Curtin, Philadelphia ; Dr. E. L. Shurly, Detroit ; Dr. A. L. Loomis, New York. Representatives to Congress, Dr. A. L. Loomis, New York ; Dr. F. Donaldson, Baltimore, Alternate.

AMERICAN PUBLIC HEALTH ASSOCIATION.

SECRETARY'S OFFICE, CONCORD, N. H., July 7, 1891.

(Preliminary Circular.)

THE nineteenth annual meeting of the AMERICAN PUBLIC HEALTH ASSOCIATION will be held at Kansas City (Missouri, Kansas), October 20th, 21st, 22d, 23d, 1891.

The Executive Committee have selected the following topics for consideration at said meeting :

1. Sanitary Construction in House Architecture.

(a) Heating.

(b) Lighting.

(c) Drainage.

(d) Ventilation.

2. Railroad Sanitation.

3. Meat Supplies.

4. Milk Supplies of Cities.

5. Arsenical Papers and Fabrics.

6. Isolation Hospitals for Infectious Diseases in Cities.

7. Papers upon any of the subjects upon which special committees have been appointed.

8. Papers on Miscellaneous Sanitary and Hygienic Subjects.

All papers will be received by the Executive Committee subject to the requirements of the By Laws. Preference will be given, however, to papers upon the subjects selected by the Committee in making up the daily programme of the meeting.

All persons who propose to present papers at the next meeting of the Association will be governed by the following By-Laws of the Executive Committee :

" 4. All papers presented to the Association must be either printed, type-written, or in plain handwriting, and be in the hands of the Secretary at least twenty days prior to the annual

meeting, to insure their critical examination as to their fulfilling the requirements of the Association.

"5. If any paper is too late for critical examination, said paper may be so far passed upon by the Executive Committee as to allow its reading, but such paper shall be subject to publication or non-publication as the Executive Committee deem expedient.

"6. All papers accepted by the Association, whether read in full, by abstract, by title, or filed, shall be delivered to the Secretary as soon as thus disposed of, as the exclusive property of the Association. Any paper presented to this Association and accepted by it shall be refused publication in the transactions of the Association if it be published in whole or in part by permission or assent of its author in any manner prior to the publication of the volume of transactions, unless written consent is obtained from the Publication Committee.

"7. Day papers shall be limited to twenty minutes, and evening papers to thirty minutes, each."

Invitations extended to individuals to prepare papers for the Association do not imply their acceptance by the committee, merit alone determining that question.

All communications relating to local matters should be addressed to E. R. Lewis, M.D., Chairman Local Committee of Arrangements, Kansas City, Mo.

Another circular will be issued before the meeting, giving transportation rates, hotel rates, etc.

Blank applications for membership can be obtained by addressing the Secretary, or Chairman of the Local Committee of Arrangements.

IRVING A. WATSON, *Secretary.*

Extracts from Constitution.

The objects of this Association shall be the advancement of Sanitary Science and the promotion of organizations and measures for the practical application of public hygiene.

The members of this Association shall be known as Active and Associate. The Executive Committee shall determine for which class a candidate shall be proposed. The *Active* members shall constitute the permanent body of the Associ-

ation, subject to the provisions of the constitution as to continuance in membership. They shall be selected with special reference to their acknowledged interest in or devotion to sanitary studies and allied sciences, and to the practical application of the same. The *Associate* members shall be elected with special reference to their general interest only in sanitary science, and shall have all the privileges and publications of the Association, but shall not be entitled to vote. All members shall be elected as follows :

Each candidate for admission shall first be proposed to the Executive Committee in writing (which may be done at any time), with a statement of the business or profession and special qualifications of the person so proposed. On recommendation of a majority of the committee, and on receiving a vote of two thirds of the members present at a regular meeting, the candidate shall be declared duly elected a member of the Association. The annual fee of membership in either class shall be five dollars.

Officers : President, Frederick Montizambert, M.D., Edin.; F.R.C.S.; D.C.L.; Medical Superintendent Canadian Quarantine Service, Quebec ; First Vice-President, Dr. Thomas F. Wood, Wilmington, N. C.; Second Vice-President, Dr. Henry B. Horlbeck, Charleston, S. C.; Secretary, Dr. Irving A. Watson, Concord, N. H.; Treasurer, Dr. J. Berrien Lindsley, Nashville, Tenn.

ALBANY, N. Y., July 3, 1891.

AN OPEN COMPETITIVE EXAMINATION of candidates for junior assistant physician in any of the State hospitals and asylums will be held at the office of the Civil Service Commission, Albany, N. Y., Thursday, August 20th, 1891, commencing at ten o'clock A.M. A candidate for the position must be a citizen of the State of New York, at least twenty-one years of age, and have had at least one year's experience in a hospital, or three years' experience in the general practice of medicine. For application blank, address the Secretary of the New York Civil Service Commission, Albany, N. Y.

JOHN B. RILEY, *Chief Examiner.*

THE SANITARIAN.

AUGUST, 1891.

NUMBER 261.

ATMOSPHERIC POLLUTION—GERMS AND THEIR CULTURE.

By AN EXPERT.

“THERE are more things, twixt heaven and earth, Horatio, than are dreamt of in our philosophy.” My theme is atoms, to which Shakespeare’s ideal atom, “no bigger than the round little worm pricked from the busy finger of a maid,” is hugely colossal; they are—Dr. Burrell calls them—“our invisible foes.”

Air and water are essential to the existence of all known life. Bodily health is supported by taking quantities of both at short intervals. Both may, and often do become the vehicles of deadly poison.

It is a fact that chemical analysis fails to show a dangerous contamination of water, and will always fail to detect the specific poison of the water affected with discharges of an infectious nature.

Water should be kept free from all possible means of contamination by sewage. Perfect cleanliness can only guarantee safety. There is nothing so important to all animal creation, yet so heedlessly regarded by the mass of mankind.

A man breathes about 18 times a minute, and uses about 3000 cubic feet of air per hour.

It is only of late years that we know with what we have to deal to prevent the spread of infectious diseases. Impure air should never be breathed, nor should preventable causes be allowed to pollute the air.

Contagia or infection consists physically of minute solid particles; the process of contagion consists in the passage of

these from the bodies of the sick into the surrounding atmosphere, and of the inhalation of one or more of them by those in the immediate neighborhood.

The minute organisms capable of inducing changes analogous to fermentation have lately received great attention, and several important diseases are distinctly traced to them.

Man's invisible foes, the bacteria, which swarm through the air, infest decomposing materials, are minute organisms, 1-25th of the 1000th of an inch in diameter, and which may under favorable conditions multiply at the rate of 300 billions in 48 hours.

Dr. Dallinger, F.R.S., and Dr. Drysdale, in their "Recent Researches in Micro-organisms," have found that the most powerful lens was powerless to reveal any trace of organic structure in the little speck of protoplasm known as bacteria termo, 50,000,000 of which can lie together in the 100th part of a square inch. In putrescent animal and vegetable matter it is the first organism to appear; it has the power of locomotion, it takes in food and assimilates it, it secretes, and its power of multiplication is enormous. This creature can execute powerful, rapid, and graceful movements; it was found to possess a flagellum at each end, so delicate as to have a width only of 1,204,700th of an inch, and by their action it makes wavelike leaps, somewhat like a shoal of porpoises, and yet this thing of life and rhythmic movement is, so far as man can see, but a speck of structureless jelly.

The multiplication of these lowly organisms—it is only 1-5000th of an inch in length. Before the act of fission began in the form it gathered itself into a little ball of jelly. Watching this protoplasmic speck under a power of 3000 or 4000 diameter, its substance was seen to be intensely agitated, and fissures, which deepened into clefts, showed themselves all over the sphere. The whole mass then began to writhe like a knot of eels, and in the course of from seven to thirty minutes the different portions separated and swam away, fully equipped forms, and soon attained the parent size.

On another monad fertilized parental products were observed, and seen to grow from egg to adult; the fluid emitted in this instance, even under the highest powers of the microscope, showed at first no trace of granules in it; but after

watching through a lens magnifying 5000 diameter, the minutest conceivable specks became visible. "I can only compare," says Dr. Dallinger, "the coming of these to the growth of the stars in a starless space upon the eye of an intense watcher in a summer twilight." Once detected, the development of these sporules was followed until it reached the parent stage.

The most satisfactory experiments show that though the adult form of micro-organism was killed at 140° , its spores do not cease to germinate until a temperature of 290° F. has been attained, but that all germs passing from the sewers into the air we breathe can be rendered safe by passing through gauze wire heated to 300° to 400° F.

Careful research has shown that sewer gas is not of itself poisonous. Average analysis gives 73 per cent hydrogen, 16 carbonic acid, 10 nitrogen, with traces of sulphuretted hydrogen and ammonia, accompanied with a putrid organic vapor. Not one of these gases is capable of producing the diseases attributed to sewer gas; it is the vapor or fume containing the infinitesimal infectious atoms that is added to the air in the sewers, by the breaking of the sewage bubbles on the surface, and they are carried with the light hydrogen from the sewers into the air we breathe that is the cause of the diseases associated with and spread by sewers.

When this poison invades a dwelling either from interior or exterior sources, the lives of the people are jeopardized as positively as if they were compelled to breathe a mephitic gas. That decaying organic matters, more particularly animal excretions, give rise to a subtle blood poison, which as yet evades chemical analysis, is a positive deadly fact. This improper care and disposition of effete matter will poison air, water, and soil. The evil effects of sewer air are due to these products. Against this disinfectants are wholly if not quite useless. Their supposed value rests on a false basis; they produce a false sense of security, as we are apt to forget that the germs carried by the sewer air retain their vitality long after the odor is gone. Diphtheria is contagious and infectious, the poison retains its vitality from three months to two years.

The true value of disinfectants was proved by Professor

Frankland in his experiments with mutton broth, infested with live vermin and swarming with organisms ; various gases were introduced into the globes, and a course of contact with the liquid, teeming with bacteria, oxygen was tried ; hydrogen, nitrogen, and carbonic acid also. They got on as well in oxygen as they did in carbonic acid. The bacteria seemed to delight equally in any one of them, could live for weeks in nothing but pure carbonic acid. Cyanogen was then introduced, and they certainly did sink a little under it ; they recovered in the course of a week or so, and went on living in that gas in a fairly healthy condition. Sulphurous acid gas was then introduced. The broth and the air saturated with it seemed to have very little effect upon them ; their motions were not stopped, and they seemed to be as lively after the application as before it, and the same was the case with several other reagents. These experiments prove that there is only one true disinfectant—viz., fire, for sewer air.

Every gallon of average sewage gives off $1\frac{1}{4}$ to $1\frac{1}{2}$ cubic inches of gas per hour. Every 100,000 gallons of sewage gives off in the twenty-four hours during its travels through the sewers between 7000 and 8000 cubic feet of infectious air into the atmosphere, and our chronic institutions of typhoid, scarlatina, small-pox, and diphtheria kill more annually than the dreaded cholera.

The "heathen Chinees" gently hint that we are barbarous. A moment's reflection will prove that it is loathsome and barbarous to allow the acme and quintessence of filth, the sewer air, to pass unpurified into the air we breathe ; so we must plead guilty to the soft impeachment. Probably the Chinese, in their great contiguity, profited by the fate of those modern cities, Thebes, Babylon, Nineveh, where sewers were introduced and the inhabitants swept away by pestilence. By Rome's cloacæ and marquesa and its malaria, they have learned that sewage air, "like the fabled Upas, blights all healthy life and makes a desert around it." If they had had sewers and neglected the effluvium as we do, they would never have possessed a population of 400,000,000.

A beneficent and well-intentioned Government recognizes and provides against this proved primary source of disease in Section 19 of the Public Health Act, 1875, which enacts that

every local sanitary authority shall cause the sewers belonging to them to be constructed, covered and ventilated, so as not to be a nuisance or injurious to the public health, and to be properly cleansed and emptied ; and this evil is rampant still, as his Satantic Majesty provides the necessaries to carry out the conditions—or else the governments wink at and encourage covertly this Malthusian doctrine.

Since the passing of the Public Health Act, 1875, the deaths from zymotics or preventable diseases, per Registrar-General's reports, average 90 to 100,000 per annum—that is, nearly a million souls sent to their account before their time, with all these imperfections on their heads, in the ten years since the passing of the Act ; and as only one case in ten is fatal, the sickness, distress, and misery caused by this official neglect is appalling.

“ The laws were made for the unjust.” Is the local government board and its ramifications above the law ? Does the law of nations apply to them in the sense that wilfully to kill one person is murder, pure and simple ; to kill thousands is to make the hero, whether the weapon is the sword or sewage ? It is a familiar doctrine that persons are not to be held liable for the remote and indirect consequences of these acts, but only for such as might reasonably have been anticipated and guarded against.

This wise principle was affirmed by Lord Bacon. The deaths from zymotics or preventable causes in April, May, and June, 1885, were, per Registrar-General's report, 14,183—that is, a death from preventable causes every eight or nine minutes. The sewer air is the principal factor in spreading these miasms. Why not cremate the air at the exit from the sewers, where it is perfectly under control ? In the selection of the means for so doing, the authorities must prove that it is efficient to increase, and not in any way impede the ventilation of the sewers ; it must be constant in its action, and act entirely independent of atmospheric changes ; and that it is so constructed that not one single embryo atom of disease can escape.—*The Plumber and Decorator, London.*

A CONTRIBUTION TO THE ETIOLOGY OF DIPHTHERIA.*

A PAPER READ BEFORE THE ROYAL SOCIETY, LONDON, MAY 22D, 1890—REPRINTED FROM PROOF-SHEETS GIVEN BY DR. KLEIN TO DR. C. N. HEWITT, SECRETARY OF THE STATE BOARD OF HEALTH OF MINNESOTA.

By E. KLEIN, M.D., F.R.S.

THE microbe, which was first described by Klebs (at the Weisbaden Congress in 1883), then isolated and grown in artificial cultures by Löffler ("Mitth. aus dem K. Gesundheitsamte," vol. ii.) from human diphtheritic membrane, was shown by this observer to act virulently on various animals. The Klebs-Löffler bacillus—by which name the diphtheria microbe is known—is the one with which also Roux and Yersin ("Annales de l'Institut Pasteur," II., No. 12) obtained positive results on guinea-pigs.

In the Reports of the Medical Officer of the Local Government Board for 1888-89, and 1889-90, I have shown that there occur in diphtheritic membranes two species of bacilli, very similar in morphological respects, and also in cultures on serum and on agar, but differing from one another in this, that one species, Klebs-Löffler bacillus No. 1, is not constant in diphtheritic membranes, does not grow on solid gelatine at 19-20° C., and does not act pathogenically on animals; the other species, Klebs Löffler bacillus No. 2, is constant in diphtheritic membranes, in fact is present even in the deeper layers of the membranes in great masses and almost in pure culture, acts very virulently on animals, and grows well on gelatine at 10-20° C. Löffler, and after him other observers (Flügge, "Die Mikroorganismen," 1886), considered it as a character of the diphtheria bacillus that it does not grow on gelatine below 22° C., but this character, though true of the

* This research was undertaken for the Medical Department of the Local Government Board, and is communicated to the Royal Society with the permission of the Medical Officer.

Klebs-Löffler species No. 1, does not appertain to the diphtheria bacillus species No. 2. In fact, there is no difficulty in obtaining pure cultures of this bacillus on gelatine if a particle of diphtheritic membrane be taken and well shaken in two or three successive lots of sterile salt solution, and from the last lot plate cultivations on gelatine are made. In this way I have obtained the diphtheria bacillus in great numbers of colonies and in pure culture. Zarniko ("Centr. f. Bact. u. Parasit.," vol. vi., p. 154) and Escherich (*ibidem*, vol. vii., p. 8) both state that the diphtheria bacillus does grow on gelatine below 20° C.

This bacillus diphtheriæ acts very virulently on guinea-pigs on subcutaneous inoculation; at the seat of the injection a tumor is produced, which in its pathology and in microscopic sections completely resembles the diphtheritic tissue of the human. In human diphtheria the diphtheria bacillus is present only in the diphtheritic membrane, but neither in the blood nor in the diseased viscera; the same holds good for the experimental guinea-pigs. In subcutaneous inoculation with artificial culture, though it causes in these animals acute disease and death—the lungs, intestine, and kidney are greatly congested—the diphtheria bacillus remains limited to the seat of inoculation. It was for these reasons that Löffler concluded that in diphtheria the diphtheritic membrane alone is the seat of the multiplication of the diphtheria bacillus, and that here a chemical poison is produced, which absorbed into the system causes the general diseased condition and eventually death. Roux and Yersin have then separated from artificial broth cultures the bacilli and the chemical products, and, by the injection of these latter alone into guinea-pigs, have produced a general effect. I have in this year's Report to the Medical Officer of the Local Government Board, 1889-90, shown that in these experiments of injection of cultures into guinea-pigs, an active multiplication of the diphtheria bacilli at the seat of inoculation can be demonstrated by culture experiments; from the local diphtheritic tumor and the nearest lymph glands the diphtheria bacilli can be obtained in pure culture on gelatine.

On various occasions during the last three years information has reached me by Health Officers (Dr. Downes, Mr. Shirley

Murphy, Dr. Thursfield) as to a curious relation existing between a mysterious cat disease and human diphtheria in this manner, that a cat or cats were taken ill with a pulmonary disease, and while ill were nursed by children, and then these latter sickened with well-marked diphtheria. Or children were taken ill with diphtheria, and either at the same time or afterward the cat or cats sickened. The disease in the cat was described as an acute lung trouble; the animals were quiet, did not feed, and seemed not to be able to swallow; in some cases they recovered, in others they became emaciated, while the lung trouble increased, and ultimately they died. In one instance—in the north of London, in the spring, 1889—this cat malady, occurring in a house where diphtheria soon afterward appeared among the children, was of a widespread nature; a veterinary surgeon—Dr. Daniel—informed me that at that time he had several patients among cats affected with the disease, consisting in an acute catarrhal affection, chiefly of the respiratory passages. He furnished me with two such animals: one that after an illness of several weeks had died, another that was sent to me in a highly emaciated state, affected with broncho-pneumonia; this animal was paralyzed on the hind limbs. In both instances the *post-mortem* examination showed severe lung disease, broncho-pneumonia, and large white kidneys due to fatty degeneration of the entire cortex. A similar condition is met with in the human subject in diphtheria. Further, I received from Dr. Thursfield, of Shrewsbury, the body of a cat that had died after a few days' illness from pneumonia in a house in which children were ill with diphtheria; another cat in the same house that became next ill with the same lung trouble also succumbed. The *post-mortem* examination of the animal that I received showed severe broncho-pneumonia and large white kidneys, the entire cortex being in a state of fatty degeneration.

Subcutaneous inoculations of cats were carried out with particles of fresh human diphtheritic membranes and with cultures of the diphtheria bacillus (report of Medical Officer of the Local Government Board, 1889-90); thereby a local diphtheritic tumor was produced at the seat of inoculation, and a general visceral disease; in the cases in which death followed after a few days the lungs were found much con-

gested ; when death followed after one or more weeks, the lungs showed broncho-pneumonia and the kidneys were enlarged and white, the cortex being in a state of fatty degeneration ; if the disease in the animals lasted beyond five to seven days, both kidneys were found uniformly white in the cortex ; if of shorter duration, the fatty degeneration was sometimes only in patches. Although in these experiments the bacillus diphtheriæ was recoverable by cultivation from the diphtheritic tumor at the seat of inoculation, there were no bacilli found in the lungs, heart's blood, or kidney, and the conclusion is justified that, just as in the human diphtheria and in the diphtheria produced by subcutaneous inoculation in the guinea-pig, so also in these experimental cats the visceral disease must be a result of the action of a chemical poison produced by the diphtheria bacillus at the seat of inoculation.

From this it is seen that the similarity between the artificial disease and the natural disease in the cat is very great, and the question that presents itself is, In what manner does the animal receive or give the diphtheritic contagium in the natural disease ? The natural disease in the cat is in its symptoms and pathology a lung disease, and it is reasonable to suppose from analogy that the lung is the organ in which the diphtheritic process in the cat has its seat. The microscopic examination of the diseased lung of cats that died from the natural disease bears this out, the membrane lining the bronchi in the diseased portions of the lobules presenting appearances which in microscopic character coincide with the appearances in the mucous membrane of the human fauces, pharynx, or larynx in diphtheria. But the correctness of the above supposition, that diphtheria has its seat in the lung of the cat naturally diseased, was proved by direct experiment. Broth culture of the bacillus diphtheriæ was introduced into the cavity of the normal trachea without injuring the mucous membrane. The animals became ill with acute pneumonia, and on *post-mortem*, two to seven days after, there was found extensive pneumonia, and fatty degeneration of the kidney. The bronchi, infundibula, and air cells of the inflamed lobules were found occluded by and filled with exudation which under the microscope bears a striking resemblance to human diphtheritic membranes, and in the muco-purulent exudation

in the large bronchi and trachea the diphtheria bacilli were present in large numbers.

During the last ten or twelve years certain epidemics of diphtheria have occurred which were traced to milk, but the manner in which that milk had become contaminated with the diphtheritic virus could not be demonstrated, although the evidence as to the milk not having been directly polluted from a human diphtheria case was very strong. The epidemic of diphtheria that prevailed in the north of London, in 1878, investigated by Mr. Power, for the Local Government Board, then the epidemic that occurred in October, 1886, at York Town and Camberley, the epidemic in Enfield, at the beginning of 1888, and in Barking, toward the autumn of 1888, were epidemics of this character. Mr. Power, in his Report to the Local Government Board on the York Town and Camberley outbreak, states (page 13) that a veterinary surgeon had certified that the cows from whom the infected milk was derived were all in good health, but that two of the cows showed "chaps" on their teats, and he adds that even two or three weeks after the epidemic had come to an end—the use of milk having been in the meanwhile discontinued—he saw at the farm one cow which had suffered chapped teats. At Enfield a veterinary inspector had also certified that the cows were in good health; but at Barking the veterinary inspector found sores and crusts on the udder and teats of the cows.

I have made experiments on milch cows with the diphtheria bacillus, which appear to me to throw a good deal of light on the above outbreaks of diphtheria.

Two milch cows* were inoculated with a broth culture of the diphtheria bacillus derived from human diphtheria. In each case a Pravaz syringe^{ful} was injected into the subcutaneous and muscular tissue of the left shoulder. On the second and third days there was already noticed a soft but tender swelling in the muscle and the subcutaneous tissue of the left shoulder; this swelling increased from day to day, and reached its maximum about the end of the week; then it gradually became smaller but firm. The temperature of both animals was raised on the second and third day, on which

* The cows had been kept under observation previous to the experiment for ten days and were in all respects perfectly normal.

days they left off feeding, but after this became apparently normal. Both animals exhibited a slight cough, beginning with the eighth to tenth day, and this gradually increased. One animal left off feeding and ruminating on the twelfth day, "fell in" considerably, and died in the night from the fourteenth to fifteenth day; the other animal on the twenty-third to twenty-fourth left off taking food, "fell in" very much, and was very ill; it was killed on the twenty-fifth day.

In both animals, beginning with the fifth day, there appeared on the skin of the udder, less on the teats, red raised papules, which in a day changed into vesicles, surrounded by a rim of injected skin, the contents of the vesicles was a clear lymph, the skin underneath was much indurated and felt like a nodule; next day the contents of the vesicle had become purulent, *i.e.*, the vesicle had changed into a pustule; in another day the pustule dried into a brownish-black crust, with a sore underneath; this crust became thicker and larger for a couple of days, then became loose, and soon fell off, a dry healing sore remaining underneath. The whole period of the eruption of papules, leading to vesicles, then to pustules, and then to black crusts which, when falling off, left a healing dry sore behind, occupied from five to seven days. The eruption did not appear in one crop: new papules and vesicles came up on the udder of one cow almost daily between the fifth and eleventh day after inoculation, in the other cow between the sixth and tenth day; the total number of vesicles in the former cow amounted to about twenty-four on the udder, four on the teats; in the latter they were all on the udder and amounted to eight in all. The size of the vesicles and pustules differed: some were not more than $\frac{1}{8}$ of an inch, others larger, up to $\frac{1}{2}$ – $\frac{3}{4}$ of an inch in diameter; they had all a rounded outline, some showed a dark centre. From one of the above cows on the fifth day milk was received from a healthy teat, having previously thoroughly disinfected the outside of the teat and the milker's hand; from this milk cultivations were made, and it was found that thirty-two colonies of the diphtheria bacillus without any contamination were obtained from one cubic centimetre of the milk.

Unlike in the human, in the guinea-pig and in the cat the diphtheria bacillus passed from the seat of inoculation into

the system of the cow ; this was proved by the demonstration of the diphtheria bacillus in the milk. But also in the eruption on the udder, the presence of the diphtheria bacillus was demonstrated by microscopic specimens and particularly by experiment. With matter taken from the eruption—vesicles and pustules—of the udder, two calves were inoculated into the skin of the groin ; here the same eruption made its appearance : red papules, rapidly becoming vesicular, then pustular, and then became covered with brown-black crusts, which two or three days after became loose and left a dry healing sore behind. More than that, the calves that showed this eruption after inoculation became affected with severe broncho-pneumonia and with fatty degeneration of the cortex of the kidney. In the two cows above mentioned, on *post-mortem* examination, both lungs were found highly congested, œdematous, some lobules almost solid with broncho-pneumonia in the upper lobes and the upper portion of the middle or lower lobe respectively ; the pleural lymphatics were filled with serum and blood. Hemorrhages in the pericardium and lymph glands, and necrotic patches were present in the liver. At the seat of inoculation, there were in both cases a firm tumor consisting in necrotic diphtheritic change of the muscular and subcutaneous tissue. In this diphtheritic tumor continuous masses of the diphtheria bacillus were present ; their gradual growth into and destruction of the muscular fibres could be traced very clearly.

It appears, then, from these observations that a definite disease can be produced in the cow by the diphtheria bacillus, consisting of a diphtheritic tumor at the seat of inoculation with copious multiplication of the diphtheria bacillus, a severe pneumonia, and necrotic change in the liver ; the contagious nature of the vesicular eruption on the udder and excretion of the diphtheria bacillus in the milk prove that in the cow the bacillus is absorbed as such into the system.

From the diphtheritic tumor by cultivation, pure cultures of the diphtheria bacillus were obtained ; a small part removed from the tumor with the point of the platinum wire, and rubbed over the surface of nutrient gelatine or nutrient agar, yielded innumerable colonies of the diphtheria bacillus without any contamination. In cultural characters in plate,

streak, and stab cultures and in cover-glass specimens of such cultures, this cow diphtheria bacillus coincided completely with the human diphtheria bacillus, but in sections through the diphtheritic tumor of the cow a remarkable difference was noticed between it and the bacillus from the cultures; inasmuch as in the tissue of the tumor the masses of the microbe, both in the necrotic parts, as also where growing into and destroying the muscular fibres, were made up of filaments which in aspect resembled to a considerable degree the hyphæ of a mycelial fungus. But that it was really the diphtheria bacillus was proved by culture experiments and by cover-glass specimens. In the latter the transitional forms between typical diphtheria bacillus and long filaments with terminal knob-like swellings, with spherical or oblong granules interspersed here and there in the threads, could be easily ascertained. In the large number of cultivations that were made of the fresh tumor in both cows, the colonies obtained were all of one and the same kind—viz., those of the diphtheria bacillus; no contamination was present in any of the cultivations.

EFFECTS OF VENTILATION ON MICRO-ORGANISMS.—Dr. Richard Stern has made experiments on this subject in a room in which he could have quiet air, or a more or less complete ventilation. The openings in the walls of the room were so arranged that he could admit the air from without either at the upper part near the ceiling and convey it off near the floor on the opposite side of the room (winter ventilation), or the air could be admitted near the floor and conducted out on the opposite side of the room near the ceiling (summer ventilation). The rapidity of the ventilation was also under complete control. The air of the room was intentionally loaded with micro-organisms. Pure cultures were mixed with the dust collected from school-rooms and factories. This was then dried and pulverized and blown about the room. The air was then examined for the number of micro-organisms, by Petri's method at various times. The conclusions arrived at were: 1. That the micro-organisms rapidly sink to the floor in quiet air. The finer the dust upon which the micro-

organisms rest the slower the gravitation. 2. The usual ventilation, effecting a renewal of air from one to three times an hour, has no effect upon the removal of micro-organisms with summer ventilation, and only to a very limited extent with winter ventilation. 3. Ventilation, effecting a more rapid renewal of air (six or seven times to the hour), effects the removal of micro-organisms, but slightly without a sensible draught. 4. A rapid and complete removal of the micro-organisms from the air is only attainable with a strong draught. 5. Micro-organisms are not blown off from the floor, walls, furniture, clothing, etc., even with the stronger draughts. 6. The evolution of steam in a room is not capable of rapidly and completely precipitating the micro-organisms, although it hastens this process to an appreciable extent.—*Zeitschrift für Hygiene.*

DURATION OF LIFE.—An eminent German statistician, says *The Insurance Agent*, has lately given the following as facts in regard to longevity: The average duration is 37 years. One fourth the population dies before attaining the seventeenth year. Of 1000 persons only one reaches the age of 100 years, and six that of 65 years; 35,214,000 die every year; 96,480 every day; 4020 every hour; 67 every minute; the births amount to 36,792,000 every year; 100,800 every day; 4200 every hour; 70 every minute. Married people live longer than the unmarried, and civilized nations longer than the uncivilized. Tall persons enjoy a greater longevity than small ones. Women have a more favorable chance of life before reaching their fiftieth year than men, but a less favorable one after that period. The proportion of married persons to single ones is as 75 to 1000. Persons born in Spring have a more robust constitution than those born at any other seasons. Births and deaths occur more frequently at night than in the daytime. It may finally be added that only one fourth of the male inhabitants of the globe grow up to carry arms or perform military service.

LONGEVITY OF ACTORS.

A CORRESPONDENT, interested in Mr. Homan's excellent paper in our July number, sends us the following, he thinks he clipped from the Boston *Herald*, two or three years ago :

" There appeared recently a brief article, which took the ground that ' the late hours into the night which it is necessary for the actor to keep, and the excitement attending the work of the profession, to say nothing of breathing the bad air of the theatre in front of the stage, and being subjected, when heated, to the draughts on and behind it, would, in any ordinary process or reasoning, argue ill for long life to an actor. Yet the late John Gilbert is only one of several instances proving that, where actors take ordinary care of themselves, they are long-lived in their calling. The early deaths in it are mostly to be traced to excesses or indiscretion.' Time was when the argument might apply, but nowadays it has no apparent significance. Owing to the present state of our drama—the desire on the part of our audience to see but one piece acted of a night, the run of that piece sometimes for an entire season, and the added desire for the close of the performance at an early hour—there exists no possible necessity for the actor to keep later hours than do his audiences, and, in a great majority of instances, he can seek his pillow at a much earlier period if he so desire.

" At the present time there exists no necessity for the actor to consume the midnight taper in studying a new part for the morrow evening's performance. All that is changed. During the run of the piece he has not, at the utmost, more than three hours' work before him out of the twenty-four. In this respect he enjoys a happy lot far in excess of the journalist, the lawyer, the physician, and almost all the devotees of the liberal professions. He certainly inhales no more bad air of a night than does the audience, and he is to the full longer-lived than his average auditor. The records of the stage go to prove this. John Gilbert, instead of being ' only one of several instances proving that where actors take ordinary care

of themselves they are long-lived in their calling,' is one of the great majority that has established the rule beyond a doubt.

"The writer has probably seen as much of actors and actresses as the next man living in Boston. He is familiar with their habits, and knows that they take quite as good care of themselves as do other individuals, and are to the full quite as solicitous as to the state of their health. They take constitutional walks daily, in all seasons and in all weather; they practise out-of-door sports, and though their calling, in a physical point of view, is not so laborious as that of the mechanic, they take as much if not

MORE BODILY EXERCISE,

and inhale daily a vaster quantity of health-giving ozone. For the purpose of showing to what age the actor in general averages, below is given a list of some of the best known and respected of the profession, with the dates of their birth and death, taking none less than 40 years:

"Ira Aldridge, the negro tragedian, born in 1804, died in Lodez, Poland, August 7th, 1867—63.

"G. A. Amherst, born 1776, died August 12th, 1851—75.

"George H. Andrews, born 1798, died April 7th, 1860—68.

"Thomas Archer, born 1776, died May, 1848—72.

"Margaret Ayling lives in Boston, aged 70.

"Andrew Jackson Allen, born December, 1776, died October 29th, 1853—77.

"Giles L. Barrett, born 1744, died November 18th, 1809—65; George H., his son (Gentleman George), born January 9th, 1794, died September 5, 1860—66.

"George Bartley, born 1784, died July 22d, 1858—74.

"Charles Bass, born March 5th, 1803, died May 5th, 1863—60.

"William H. Bellamy, born August 5th, 1800, died April 15th, 1866—66.

"John Bernard, born in 1756, died November 29th, 1828—72.

"Francis Blissit, born in 1773, died in 1850—77.

"Dion Boucicault lives at the age of 69 (1889).

" John Branham, the greatest of all English operatic singers, born June 20th, 1774, died February 17th, 1856—82.

" William F. Brough, born 1798, died May 21st, 1867—69.

" John Brougham, born May 9th, 1814, died June 7th, 1880—66.

" Watkins Burroughs, born in 1795, died July 12th, 1869—74.

" James H. Caldwell, born in 1793, died September 11th, 1863—70.

" William Chapman, born in 1769, died August, 1839—70.

" Thomas Comer, born December 19th, 1790, died July 27th, 1862—72.

" Henry J. Conway, born 1800, died April 12th, 1860—60.

" Thomas Apthorp Cooper, born 1776, died April 21st, 1849—73.

" Charles Walter Couldock, born April 25th, 1815, still lives and acts, at the age of 74.

" Joseph Cowell, born August 7th, 1792, died November 14th, 1863—71.

" Mrs. H. Cramer, born in 1803, died May 30th, 1868—65.

" William Creswick, born 1813, died June, 1888—75.

" Charlotte Cushman, born July 23d, 1816, died February 18th, 1876—60.

" Edward L. Davenport, born 1816, died September 1st, 1877—61.

" William P. Davidge, born April 27th, 1814, died 1888—74.

" James A. Dickson, born 1774, died April 1st, 1853—79.

" William Downton, born 1765, died 1846—81.

" Samuel Drake, born 1772, died 1847—75.

" Mrs. John Drew lives and acts in her seventy-first year, she having been born in 1818.

" Harry Edwards is in harness at 65—born September 3d, 1824.

" Thomas Faulkner, born in 1775, died March 6th, 1847—72.

" Henry J. Finn, born 1785, died November 17th, 1851—66.

" Edwin Forrest, born March 9th, 1806, died December 12th, 1872—66.

" John Gibbs Gilbert, born February 27th, 1810, died June 17th, 1889—79. His first wife, Mrs. Campbell (*née* Maria Deth) was born in Philadelphia in 1806, died in New York, April 27th, 1866—60.

" Isabella Glynn, born in 1823, died in 1889—66.

" Mrs. John Greene, born March 23d, 1800, died January 10th, 1862—62.

" George H. Griffin, still acting, was born in 1822, and is now 67.

" James H. Hackett, born March 15th, 1800, died at the age of 72.

" Thomas Hadaway, born in 1801, died at the age of 72.

" Charles Hall was born June 23d, 1819, and was upward of 60 when he died.

" Lewis Hallam, the younger, was born in 1740, died November 1st, 1808—68.

" David Hanchett, born June 27, 1823, is still acting, at the age of 66.

" George Holland, born December 6th, 1791, died at upward of 80.

" James Henry Horncastle, operatic singer, born May 26th, 1801, died May 6th, 1869—68.

" George C. Howard, born in 1820, died January 18th, 1887—67.

" Benjamin Charles Incledon, operatic singer, born in London, 1757, died February 11th, 1826—69.

" Abraham Jackson, born in 1809, died May 7th, 1886—75.

" John Jamison, born January 6th, 1799, died in 1868—69.

" George F. Jervis, born in 1784, died March 25th, 1851—67.

" John Johnson, born 1759, died October 25th, 1819—60.

" George Jones, the Count Johannes, born in 1810, died at 70.

" William Jones, born in 1781, died December 1st, 1841—60.

" Frances Anne Kemble (Fanny Butler), born in 1814, is still alive at the age of 78, and vigorous, too.

" Thomas Kilner, born in 1777, died January 2d, 1862—85.

" James Sheridan Knowles, born in 1784, died November 30th, 1862—78.

“Walter M. Leman is still alive, and is over 85.

“William Charles McCready, born March 3d, 1793, died April 27th, 1873—80.

“J. H. McVicker, still alive and an active manager at the age of 67, was born February 14th, 1822.

“Mrs. James G. Maeder (Clara Fisher), born July 14th, 1811, is still active with us at the age of 78.

“Wyzeman Marshall, a familiar figure upon our streets daily, is in the vicinity of 70.

“Charles Kemble Mason, born in November, 1805, lived to be close on to 70 years.

“Charles Matthews, the elder, was born July 28th, 1776; died June 28th, 1835—60. His son attained to a much greater age.

“Robert C. Maywood, born in 1796, died December 1st, 1856—60.

“Owen Morris, born in 1719, died November, 1809—90. His wife was the original ‘Lady Teazle’ in the United States.

“James E. Murdock, born in 1812, is still active at 77.

“Andrew Jackson Neafe, born in 1815, is in the real estate business in New York.

“John E. Owens, born in 1823, died December 7th, 1886—63.

“Henry Placide, born in 1799, lived to be over 70, and his brother Thomas was something older.

“Charles J. Porter, born July 25th, 1797, died October 5th, 1867—70.

“Joseph Proctor, still in harness, can count fully 70 years.

“Peter Richings, born 19th, 1797, died at over 70.

“John Sefton, born January 15th, 1805, died September 19th, 1868—63.

“Edmund Simpson, born in 1784, died July 31st, 1848—64.

“James William Wallack, born August 20th, 1794, died December 25th, 1864—70; his brother Henry, born in 1790, lived to a much longer age.

“John Sinclair, born in 1793, died September 22d, 1857—64.

“Sol Smith, born April 20th, 1801, died February 14th, 1869—68.

“William H. Smith, born December 4th, 1806, lived to be 70.

"George G. Spear, born December 19th, 1809, lived to be about 75.

"James G. Stoddard, born October 21st, 1827, is still acting at the age of 62.

"James H. Taylor, born August 24th, 1825, is still in harness at the age of 64.

"Edward N. Thayer, born in 1798, died upward of 70.

"Jacob W. Thoman, born January 8th, 1816, died January 26th, 1886—70.

"Charles R. Thorne, born in New York in 1814, is still active at 76.

"Joseph S. Tyler, born in 1751, died January 26th, 1823—72.

"John M. Vandenhoff, born in 1790, died October 4th, 1861—71.

"John Lester Wallack, born January 1st, 1820, died September 6th, 1888—68.

"William Warren, the elder, born May 10th, 1767, died October 19th, 1832—65.

"William Warren, the younger, born November 17th, 1812, died September 21st, 1888—76.

"Francis Courtney Wemyss, born May 13, 1797, died January 5th, 1859—62.

"William B. Wood, born May 26th, 1779, died September 23d, 1861—82.

SOME ENGLISH RECORDS.

"The above had all appeared on the American boards, and many of them were familiar to the play-goers of the present day. Among the English actors of note who never visited this country may be mentioned: Thomas Betterton, born 1635, died 1710—75; William Henry West Bettry, born 1791, died in 1874—83; James Quinn, born 1693, died in 1766—73; David Garrick, born in 1716, died February, 1779—63; Michael Kelly, born in 1762, died in 1826—64; John Philip Kemble, born in 1757, died in 1823—66; his wife, Priscilla, an actress of note, died at the age of 90; Charles Kemble, born in 1775, died in 1854—79; Sarah Siddons, born 1775, died in 1831—76; Charles Macklin, born in 1690, died in 1797—107. He played 'Shylock' when he was 103 years old, in

which character he excelled. Helen Faucit still lives at the age of 73, she being the wife of Sir Theodore Martin ; Samuel Phelps, born in 1806, died November 6th, 1878—72 ; Mrs. Charles Kean (Ellen Tree) was 65 ; Robert Keeley was born in 1793, died February 3d, 1869—76 ; John Baldwin Brookstone was 75 ; Paul Bedford, born in 1798, died January 11th, 1871—73 ; Maria Foote (Countess of Harrington), born in 1798, died in 1867—69 ; Alfred Wigan, born March 24th, 1818, died November 29th, 1878—60.

“ But the oldest of all actors was Jean Noel, who died in Paris, January 13th, 1829, aged 118 years. He entered his profession in his eighth year, and still acted when 100 years old, having represented in all 2760 parts. He appeared before the public 28,010 times, died 1040 times, was a king 130 times, an honest man 920 times, a villain and unfortunate man 13,500 times, and he always preserved throughout these changing experiences a kind heart and the most excellent spirits. His cosmetics alone cost him \$5520, while his emoluments amounted to \$27,000.

“ Why prolong the list ? Enough has been shown to establish the fact that, in point of longevity, and devoid of any extenuating circumstances whatever, the life of the actor or actress will average to the full as long as those engaged in any other pursuits.”

HOW TO SAVE MONEY.—“ Why do you live in the country, anyhow ?” asked a New Yorker of a suburban friend.

“ To save money.”

“ Is the cost of living less ?”

“ No, slightly higher.”

“ Then how do you save ?”

“ No opera, \$50 a season. No concerts, \$25 a season. No theatres, \$50 a season. No big dinners to friends, \$100 a year. No fun of any kind, \$500 a year.”

“ Say !” said the city man, seized with an inspiration, “ wouldn’t you save money if you died ?”

THE LITTLE HOUSE.

By M. M.

ONE of the highest medical authorities is credited with the statement, that "nine tenths of the diseases that afflict humanity are caused by neglect to answer the calls of nature."

This state of affairs is generally admitted, but is usually attributed to individual indolence. That, doubtless, has a great deal to do with it, but should not part of the blame be laid upon the often unpleasant environments, which make us shrink as from the performance of a painful duty?

In social life, unless from absolute necessity or charity, people of refined habits do not call on those whose surroundings shock their sense of decency; but when they go to pay the calls of nature, they are often compelled to visit her in the meanest and most offensive of abodes; built for her by men's hands; for nature herself makes no such mistakes in conducting her operations. She does not always surround herself with the pomp and pride of life, but she invariably hedges herself in with the thousand decencies and the pomp of privacy.

But what do we often do? We build what is sometimes aptly termed "an out-house," because it is placed so that the delicate minded among its frequenters may be made keenly alive to the fact that they can be plainly seen by every passer-by and by every idle neighbor on the lookout. This tiny building is seldom weatherproof. In consequence, keen cold winds from above, below, and all around find ready entrance, chill the uncovered person, frequently check the motions, and make the strong as well as the weak, the young as well as the old, very sorry indeed that they are so often uselessly obliged to answer the calls of nature. 'Tis true, the floor is sometimes carpeted with snow, but the feet feel that to be but cold comfort, though the door may enjoy rattling its broken hasp and creaking its loose hinges.

How often, too, is the nose and the eye offended by disregard of the Mosaic injunction, found in the twelfth, thirteenth, and fourteenth verses of the twenty-third chapter of Deuteronomy ! Of course this injunction was addressed to a people who had been debased by slavery, but who were being trained to fit them for their high calling as the chosen of God ; but is not some such sanitary regulation needed in these times, when a natural office is often made so offensive to us by its environments that it is difficult for us to believe that " God made man a little lower than the angels," or that the human body is the temple of the Holy Ghost ?

Dwellers in the aristocratic regions of a well-drained city, whose wealth enables them to surround themselves with all devices tending to a refined seclusion, may doubt all this, but sanitary inspectors who have made a round of domiciliary visits in the suburbs, or the older, neglected parts of a large city, or to any part of a country town or village will readily affirm as to its general truth.

This unpardonable neglect of one of the minor decencies by the mass of the people seems to be caused partly by a feeling of false shame, and partly by an idea that it is expensive and troublesome to make any change that will improve their sanitary condition or dignify their daily lives.

The Rev. Henry Moule, of Fordington Vicarage, Dorsetshire, England, was one of the first to turn his attention to this matter. With the threefold object of improving the sanitary condition of his people, refining their habits, and enriching their gardens, he invented what he called the " dry earth closet."

" It is based on the power of clay and the decomposed organic matter found in the soil to absorb and retain all offensive odors and all fertilizing matters ; and it consists, essentially, of a mechanical contrivance (attached to the ordinary seat) for measuring out and discharging into the vault or pan below a sufficient quantity of sifted dry earth to entirely cover the solid ordure and to absorb the urine.

" The discharge of earth is affected by an ordinary pull-up, similar to that used in the water-closet, or (in the self-acting apparatus) by the rising of the seat when the weight of the person is removed.

"The vault or pan under the seat is so arranged that the accumulation can be removed at pleasure.

"From the moment when the earth is discharged and the evacuation covered, all offensive exhalation entirely ceases. Under certain circumstances there may be, at times, a slight odor as of guano mixed with earth, but this is so trifling and so local, that a commode arranged on this plan may, without the least annoyance, be kept in use in any room."

The "dry earth closet" of the philanthropic clergyman was found to work well, and was acceptable to his parishioners. One reason why it was so was because dry earth was ready to hand, or could be easily procured in a country district where labor was cheap. But where labor was dear and dry earth scarce, those who had to pay for the carting of the earth and the removal of the deodorized increment found it both expensive and troublesome.

But a modification of this dry earth closet, the joint contrivance of an English church clergyman and his brother, "the doctor," residents of a Canadian country town, who had heard of Moule's invention, is a good substitute, and is within the reach of all. This will be briefly described.

The vault was dug as for an ordinary closet, about fifteen feet deep, and a rough wooden shell fitted in. About four feet below the surface of this wooden shell a stout wide ledge was firmly fastened all around. Upon this ledge a substantially made wooden box was placed, just as we place a well-fitting tray into our trunks. About three feet of the back of the wooden shell was then taken out, leaving the back of the box exposed. From the centre of the back of the box a square was cut out and a trap-door fitted in and hasped down.

The tiny building, on which pains, paint, and inventive genius had not been spared to make it snug, comfortable, well lighted and well ventilated, was placed securely on this vault.

After stones had been imbedded in the earth at the back of the vault, to keep it from falling upon the trap-door, two or three heavy planks were laid across the hollow close to the closet. These were first covered with a barrowful of earth and then with a heap of brushwood.

Within the closet, in the left-hand corner, a tall wooden

box was placed, about two thirds full of dry, well-sifted wood ashes. The box also contained a small long-handled fire-shovel. When about six inches of the ashes had been strewn into the vault the closet was ready for use. No ; not quite ; for squares of suitable paper had to be cut, looped together with twine, and hung within convenient reaching distance of the right hand ; also a little to the left of this pad of paper, and above the range of sight when seated, a ten-pound paper bag of the toughest texture had to be hung by a loop on a nail driven into the corner.

At first the rector thought that his guests would be "quick-witted enough to understand the arrangement," but when he found that the majority of them were, as the Scotch say, "dull in the uptak," he had to think of some plan to enforce his rules and regulations. As by-word-of-mouth instructions would have been rather embarrassing to both sides, he tacked up explicit written orders, which must have provoked many a smile. Above the bin of sifted ashes he nailed a card which instructed "Those who use this closet must strew two shovelfuls of ashes into the vault." Above the pad of clean paper he tacked the thrifty proverb : "Waste not, want not ;" and above the paper bag he suspended a card bearing this warning : "All refuse paper must be put into this bag ; not a scrap of clean or unclean paper must be thrown into the vault."

This had the desired effect. Some complacently united to humor their host's whim, as they called it, and others, immediately recognizing its utility and decency, took notes with a view to modifying their own closet arrangements.

Sarah, the maid-of-all-work, caused a good deal of amusement in the family circle by writing her instructions in blue pencil on the front of the ash-bin. These were : "Strew two shuffefuls of ashes into the volt, but don't spill two shuffefuls onto the floar. By order of the Gurl who has to sweap up." This order was emphatically approved of by those fastidious ones who didn't have to "sweep up."

This closet opened off the woodshed, and besides being snugly weatherproof in itself was sheltered on one side by the shed and on another by a high board fence. The other two sides were screened from observation by lattice work, outside

of which evergreens were planted to give added seclusion and shade. A ventilator in the roof and two sunny little windows, screened at will from within by tiny Venetian shutters, gave ample light and currents of fresh air. For winter use, the rector's wife and daughters made "hooked" mats for floor and for foot support. These were hung up every night in the shed to air and put back first thing in the morning. For the greater protection and comfort of invalids, an old-fashioned foot-warmer, with a handle like a basket, was always at hand ready to be filled with live coals and carried out.

The little place was always kept as exquisitely clean as the dainty, old-fashioned drawing-room, and so vigilant was the overseeing care bestowed on every detail, that the most delicate and acute sense of smell could not detect the slightest abiding unpleasant odor. The paper bag was frequently changed, and every night the accumulated contents were burned; out of doors in the summer, and in the kitchen stove—after a strong draft had been secured—in the winter.

At stated times the deodorized mass of solid increment—in which there was not, or ought not to have been any refuse paper to add useless bulk—was spaded, through the trap-door, out of the box in the upper part of the vault, into a wheelbarrow, thrown upon the garden soil, and thoroughly incorporated with it. In this cleansing-out process there was little to offend, so well had the ashes done their concealing deodorizing work.

In using this modified form of Moule's invention, it is not necessary to dig a deep vault. The rector, given to forecasting, thought that some day his property might be bought by those who preferred the old style; but his brother, the doctor, not troubling about what might be, simply fitted his well-made, four-feet-deep box, with its trap-door, into a smoothly dug hole that exactly held it, and set the closet over it. In all other respects it was a model of his brother's.

This last is within the reach of all, even those who live in other people's houses; for when they find themselves in possession of an unspeakably foul closet, they can cover up the old vault and set the well-cleaned, repaired, fumigated closet upon a vault fashioned after the doctor's plan. A stout dry-goods box, which can be bought for a trifle, answers well

for this purpose, after a little "tinkering" to form a trap-door.

Of course dry earth is by far the best deodorizer and absorbent, but when it cannot be easily and cheaply procured, well-sifted wood or coal ashes—wood preferred—is a good substitute. The ashes must be kept dry. If they are not, they lose their absorbing, deodorizing powers. They must also be well sifted. If they are not, the cinders add a useless and very heavy bulk to the increment.

An ash sifter can be made by knocking the bottom out of a shallow box, studding the edge all round with tacks, and using them to cross and recross with odd lengths of stove-pipe wire to form a sieve.

INSURANCE WITHOUT MEDICAL EXAMINATION.

No less than three British life offices are now engaged in the hazardous experiment of dispensing with medical examinations. The substitute which they have adopted is that of reducing the amount of insurance in case of early death. One of these schemes consists of issuing an endowment, which was thought to be a novelty, until it was found that an American office nine years ago had hit on the same plan ; the idea being that of a twenty-year endowment in which just half of the sum is paid in case of death during the period. It so happens that the premium for such a policy is about the same for any age. The *London Review* takes the following sensible view of this new departure :

"The plan was devised by Mr. Pearson, actuary of the Washington, some eight or nine years ago, since which time it has been before the public. The discovery that the annual premium for such a policy does not vary at different ages was made by Mr. Pearson in 1881 or 1882. But the American offices have not ventured so far as to issue such policies without medical examination. It is considered by them that the issue, without medical examination, of policies of this class, or any class, of which the amount insured exceeds the premium paid in advance, appears to be a dangerous innovation—even in England, where the consideration of contracts by the courts is less unfavorable to insurance companies than it is in the United States. It is, of course, quite on the cards

that the office which dispenses with medical examination may succeed in avoiding excessive loss by doing only a small business under this plan, and confining it to persons who are under the immediate and personal supervision of its officers ; but it is reasonable to assume that the moment this personal knowledge or supervision ceases to be of effect, from that moment the company is running a serious and abnormal risk. The company, in fact, looks to its possession of the extra premium only to protect it against the risk of dispensing with the medical examination. We cannot help thinking that there is a very serious element of risk here. Theoretically, and so long as the business is worked upon the principles set forth in the prospectus, there seems no reason to doubt that there may be possible, in fact probable, profit ; but we cannot help thinking that, if a large business were done upon the plan, the risk of severe loss would be more than a nominal one. One thing is, however, certain, that the discovery of the principle which underlies this form of endowment policy was made some eight or nine years ago ; and we have a policy before us, together with a prospectus issued in 1882, as a substantial proof of this. But we do not think that the American companies are preparing to follow the English ones into the paths of acceptance without examination.

“ In the first place, the conditions and organization of the two countries are entirely different. In Great Britain, we have a thickly populated and exceedingly small country, where supervision and inspection are easy and prompt. We have an ancient civilization with more or less settled and precise habits of thought and procedure. From Plymouth to Perth is undoubtedly a long journey, but not to be mentioned in the same breath with the capacity of the United States of America in this particular direction. Nor are our people migratory. They, or their relations, or their relations' friends can be got at promptly. Investigation is close, and detection almost inevitable in any attempt at fraud. This could not be claimed with regard to operations in the United States. Upon the whole, we are inclined to think that business will be profitable if small, and that a large business will result in loss. Still, it will be only a small section of the public who actually object to medical examination, and it may suit the necessities of this class very well indeed.”—*Insurance Monitor*.

HIGHER MEDICAL EDUCATION—HYGIENE.

HIGHER medical education is the true interest of the public and of the medical profession. Nothing concerns more directly every individual member of the community than that our medical men shall receive a thorough and practical education. In all civilized countries except America from five to seven years are devoted to this purpose, although their students enter the medical schools with better preliminary education than the vast majority of ours enjoy.

The Medical Department of the University of Pennsylvania is the oldest and most distinguished medical school on this continent. The stand taken by this school more than fifteen years ago in lengthening the term and raising the standard of medical study produced the most conclusive effect, because it was attended with such brilliant practical results. Ever since that time its graduates have distinguished themselves by unequalled success in all professional competitions. The advance was effected only by great sacrifices and exertions on the part of the Faculty. All high-grade, scientific education is costly and demands great facilities and increased labor. So it will be again. The school which puts into operation a full four-year graded course of medical study must be ready to meet increased outlay and lessened income from students' fees for some years at least. But what is resigned in mere pecuniary profit will be many times over-compensated by the lasting influence for good exerted.

At the meeting of the Board of Trustees of the University of Pennsylvania, held May 21st, Dr. William Pepper, Provost of the University, made an offer of \$50,000 toward an endowment fund of \$250,000, and of \$1000 annually toward a guarantee fund of \$20,000 annually, for five years, conditioned upon the establishment of an obligatory graded four-year course of medical study. This was accompanied by a communication from the Medical Faculty, pledging themselves to carry out this proposal, and to enter upon the four-year course in September, 1893. It was also reported that the members of the Medical Faculty had themselves subscribed

\$10,000 annually for five years to the endowment fund. The Board of Trustees expressed warm approval of the proposed advance in medical education, but postponed their assent until the success of both funds had been demonstrated.

The approaching completion of the fine Laboratory of Hygiene, built by Henry C. Lea, Esq., will render the medical facilities of this school unequalled. It is to be hoped that the necessary pledges will be secured promptly, as the interests of the entire community are deeply involved in the success of this great advance, which will enable medical students to obtain a thorough practical education in every branch of their profession.

The Laboratory of Hygiene will be opened in February, 1892. This admirable institution will afford facilities not to be found elsewhere in America. The establishment of the four-year course will enable all students to pursue thorough courses in hygiene, bacteriology, etc., under the distinguished teachers, Dr. John S. Billings and Dr. A. C. Abbott, who leaves Johns Hopkins University to take the position of Assistant Director.

The Laboratories of Chemistry, Pathology, and Histology are unequalled in size and completeness of equipment. The clinical facilities offered in all branches will vie with those of the great European schools. During the coming summer a great central heating and lighting station will be constructed, and electric lighting, steam-heating, and admirable ventilation will be provided for the medical buildings.

It is intended to raise a guarantee fund of \$20,000 annually for five years; already about one half of this has been subscribed by the members of the Medical Faculty. A permanent endowment fund of \$250,000 must also be secured. It cannot be doubted that the offer of Provost Pepper will be effective in this direction. The Board of Trustees has judiciously postponed its assent to the proposed advance until the success of both funds is assured. Every friend of sound education and of humanity should aid in carrying this through, for it will remove a source of reproach, and will set an example which will result in the general elevation of the medical profession, and therefore in promoting the true interests of the public.

NEEDED REFORM.

SUGGESTIONS IN REGARD TO THE VISITATION OF THE SICK
AND THE BURIAL OF THE DEAD, ADOPTED BY THE ST.
LOUIS CLERICUS.

THIS article, clipped from *The Living Church*, July 25th, 1891, should receive the support and encouragement of every physician.

" 1. In all cases of sickness where the ministrations of the parish priest are desired, send for him at once. Let not those who are sick be deprived of their spiritual privileges, because of the mistaken idea that the clergyman ought, by some sort of intuition, to know of every case of illness in the parish, and to come without being sent for, or that the patient will be needlessly alarmed by the presence of a minister in the house or at the bedside.

" 2. In case of approaching death, let the pastor be notified at once, and let him commend the soul departing into the hands of its "Creator and most merciful Saviour." In case of unexpected danger, and in the unavoidable absence of the priest, let some Christian present see that the soul goes out on the 'wings of prayer.'

" 3. When death comes, if there is no near relative or friend to whom can be entrusted the arrangements for the immediate preparation of the dead, and such other matters as pertain to the burial, take counsel with your rector, and be governed by his experience and advice.

4. Let the body be prepared for burial under the supervision of some near relative or friend, and not be entrusted to the care of hired strangers or taken to an undertaker's establishment. Embalming or preserving on ice is in most cases unnecessary and a useless expense, and has been in some cases a dishonor rather than an honor to the bodies of the dead. For dress, a simple white or black robe made something like a sleeping garment, is suggested, instead of the usual dress; the dead are going to *rest*.

" 5. Do not allow a public or neighborhood exhibition of the

loved one who is asleep. Let those who are relatives or friends be quietly admitted, and let such arrangements be made as will permit the immediate family to bid adieu to the body of the dead, without being subjected to the curious gaze of a crowd. If possible, let the coffin be closed before the service begins, if the service is held at the house. In no case should the coffin be opened in the church.

“6. Simplicity and inexpensiveness in funerals are most earnestly counselled. Imperishable and costly caskets increase greatly the expense to the living, and diminish the proper respect to the dead. Interments should be private, *i.e.*, carriages should be provided by the family for their own use, for the pall-bearers, and for the officiating clergyman. Others who desire to go to the cemetery should provide their own conveyances, but it should not be considered essential that others besides the family go to the grave. In the matter of flowers, it is recommended that extravagant display be discountenanced. A few cut flowers placed by loving hands within or upon the coffin are often a more genuine token of affection than a multitude of strange devices which suggest ostentation rather than affection.

“7. When possible, the bodies of all children and baptized persons should be brought to the church—the Father’s house—for the funeral services.

“8. Except in cases of extreme necessity, burials on Sunday should be discouraged.

SUMMARY.

“The objects in view are the decent care of the bodies of the dead ; economy and simplicity in funerals ; the use of plain hearses ; the disuse of crape, scarves, plumes, velvet trappings, all floral decorations save a few cut flowers ; the discouraging of all, except members of the family and pall-bearers and the officiating clergyman, from attendance at the grave ; the early burial of the body in soil sufficient for its resolution into its ultimate elements ; the use of coffins which will rapidly decay after burial ; the substitution of burial lots for family vaults ; funerals in the church rather than at home ; and except in cases of extreme necessity, the discouragement of burials on Sunday.”

HYGIENIC CONDITIONS OF PASSENGER CARS.

By GRANVILLE P. CONN, M.D., Concord, N. H., First Vice-President National Association of Railway Surgeons.

THE problem of securing fairly good hygienic conditions in railway passenger cars is one that presents more complications than almost any other question connected with the transportation of passengers.

From thirty to sixty people, representing different ages and physical conditions, having tickets of the same class, ride from one hour to two or three days in coaches having but little ventilation, and becoming more and more filthy with each succeeding day. These people will have variable mental and intellectual powers, from the helpless infant to the crank who seems to study how to make everybody uncomfortable, and as the hygienic conditions become worse and worse on account of the accumulating dust, cinders, and other refuse matter, as well as a more disgusting condition of the closets, the women and children are obliged to endure and suffer far more than the men, for the reason that they are more strictly confined to the car, the men more generally going into the open air every time the train makes a few minutes' stop.

When we take into consideration the hygienic conditions that generally exist in an ordinary passenger coach that is used for a continuous journey of from five to fifteen hundred miles, it should not excite surprise that by the time their destination is reached the people are disgusted with their accommodations and are suffering with headaches and, perhaps, nausea. It is true that passengers are more or less responsible for the general want of cleanliness in the car, for very many good people seem to forget themselves when journeying, and permit their children, and even allow themselves to throw upon the floor of the car nutshells, banana and orange peel, crumbs and remnants of lunches. In warm weather these refuse matters will in a short period render the atmosphere of a coach almost unbearable to a sensitive

stomach, and the effect upon the nervous system is very depressing.

Parlor and sleeping cars under the care of a special conductor and porter are not allowed to remain very long in an uncleanly condition, yet it is not very unfrequent that the closets of these coaches become very offensive and disgusting when making unusually long runs.

It is the common first and second class coach, that makes a continuous run of one, two, or three days, which attracts attention; and when we find the condition of the floor and closet untidy and unclean, and combined with this an atmosphere saturated with the products of respiration and perspiration, we have those unwholesome factors that serve to render most people extremely uncomfortable and unhappy.

It would not seem necessary that a car running only for an hour or two, and then remaining upon a side-track for half a day, should become offensive, yet it is not unfrequent in hot weather to find the odor of the closet pervading the whole car, and that, too, after it has been swept and dusted; but no one seems to remember to examine into the condition of the closet. This may be said to represent some of the many conditions that are far from being hygienic in their character.

The first question to be discussed must, in general terms, deal with the subject as a whole—viz. : Is it possible to make the necessary improvements without at the same time making such radical changes in the management of trains as seriously to inconvenience the travelling public?

In the early history of railroads, interchange of cars and great through lines had not been developed. The lines were short, and passengers did not feel that it was a hardship to change from one car to another. Even with such delays so much better time, as well as comfort in travelling, was experienced, that every one was satisfied. Now, long continuous journeys in the same coach have found favor with the public, and the management of our roads has made every effort to meet the popular demand. Much of this through travel is in parlor or sleeping cars, palatial in their appointments, and which, as I have said, are taken better care of than the ordinary coach.

Still, we find that the trunk lines, in meeting the demand

for through transportation, are obliged to place in through trains first and second class coaches, and every one is familiar with the advertisement of such lines—that they are running first and second class, as well as palace cars, to some great railway centre, or to the coast, as a distinguishing feature of their line to some other route that requires frequent changes from one train to another. This may be cited as one of the first of the many obstacles to be overcome in the solution of the hygienic problem, as a run of one, two, or three days may, and probably will show very great changes in temperature, especially if the journey be from north to south or southwest, or *vice versa*; therefore the conditions affecting heating and ventilation must be constantly changing.

Then, again, coaches running over several roads may be subjected to considerable changes of speed; therefore the atmospheric pressure on the outside of the cars will be changed, as the atmospheric pressure on the outside of a car moving at a rate of thirty-five or forty miles an hour is radically different from what it would be if that coach was running only twenty miles an hour. This may seem a very small matter; but when we reflect upon the condition, and remember that a great amount of fresh air is forced into a car by reason of this atmospheric pressure, it will be seen that it really constitutes an important factor in the ventilation of a coach under our present system of construction of passenger cars.

With the thermometer 20° or 30° below zero, one does not need to sit beside a car window very long before he will realize that a great deal of cold air is finding its way into the space around him, and almost every one has sometimes passed through a section filled with smoke from brush fires or old ties, and has realized how nearly instantaneously the odor will penetrate the car. It appears to me that this feature of air finding its way into a car through every opening crack, is the salvation of the traveller in cold weather, when people will sacrifice fresh air for heat, and therefore close ventilators, as they are called, in the roof of the coach, and so far as they can, hermetically seal the car. Were it not for the fact that air is forced into the coach by reason of the atmospheric pressure, and that train men and others are passing in and out at every station, thereby keeping the doors in motion, I am

not sure but passengers would, in the coldest weather, die from the depression caused by the polluted atmosphere. As it is, they remain sometimes for hours in an atmosphere rendered impure from the respiratory products of all sorts of people, some of whom may have serious forms of disease ; and it is one of the immutable laws of health that a system loaded with diseased germs or depressed by contaminated air or polluted water has less resistance to the invasion of disease and less ability to throw off any premonitory symptoms of ill-health than one who has pure air to breathe and pure water to drink.

In this connection I would add that while there are a great many patent designs offered to the management of our railroads for ventilating cars, none as yet has proven so satisfactory as to be universally adopted. It is but an act of justice to add that many roads have spent a great deal of time and money in experimenting with designs that seem, theoretically, to be of some account, but nothing as yet has stood the test of practical work, under all conditions, like the air brake or some of the other mechanical means of improving the train service, or rendering it relatively safer or more economical.

Many of the devices have good points, and under certain favorable circumstances will bring about results that justify us in predicting more positive improvements in the near future. It is too much to expect any system to be effective at all times, as the conditions vary so widely between a car in motion and one standing still at a station that any one system cannot be of use except as provided for.

Now, while we may hope to secure improvements in heating and ventilation, let us give a moment's attention to some method that might reasonably be expected to improve that department of the service which is known as car cleaning. As now conducted in the Eastern States there is some one at points where cars are set out or remain over night who is supposed to have jurisdiction over the work, employs the help, keeps their time, etc. At some large railroad centres the work is done by contract, and the contractor receives a stated sum per car, and employs his own help. I do not know of any road in New England that employs any person who has given any special thought to the work, or who might be con-

sidered as an expert in such matters ; therefore there is but little if any system, each workman doing his or her work in a routine if not in a perfunctory manner.

Frequently cars are required for use almost immediately, and one or more boys are raising a dust with their brooms before the passengers are fairly out of the coach. In such instances all that is done is to clear the floor of the most prominent portions of dirt and cinders, no attention being given to the closet. Can this order be changed without interfering with the practical working of the trains? I believe it can ; but in order to bring about practical results it may be necessary to educate the practical railroad man in the mysteries of what constitute a hygienic car.

Sanitarians, while experts in the hygiene of dwellings, grounds, cars, etc., are very liable to be very much too theoretical on matters pertaining to an active train service to assume dictation over conditions only understood by practical railroad men. A happy combination of the practical and the theoretical should be brought out, developed, and thoroughly tested under the varied conditions ordinarily found upon all lines of roads before any radical change should be recommended, for it is only by a general adoption of some practical and economical system by all roads having interchange of rolling stock that an improvement can reasonably be expected.

The management of train service has a vital interest in this question, for an intelligent public is becoming more and more critical upon matters that may affect the health of themselves or their families. People travelling for business or pleasure across the continent, or from the lakes to the gulf, pay the transportation lines whatever may be the tariff at the time ; but they reserve the right to criticise the hygienic condition of the cars, as well as the want of politeness of the employés. It is generally understood that want of politeness in an employé is an unprofitable investment in advertising, and an unclean coach will not pay any better dividends.

In general terms, what is needed is thorough instruction of the employé, whose duty it is to take care of the cars, as well as to instruct the train men that something can be done by them to keep a coach clean when on the road. Frequent

inspection should be made, certainly at the end of every division service, by some one so well informed about the service as to detect at a glance any slighting of the work at the place where the coach was last cleaned, and who should report the same at once. The responsibility should be placed, employé corrected, the same as if he had been guilty of slighting a piece of mechanical work that would endanger the lives of passengers.

It has been found necessary to employ men to look over the train at frequent intervals, and those men become very expert in detecting a cracked wheel, a journal that has lost its true alignment, that a nut is missing, or a brake that is insufficient.

Such service may seem humble, and the passenger may scarcely notice the person as he quietly passes around the train, yet his work is invaluable; and you never hear complaints from passengers when an order is received from the quiet man to vacate the car, as it is not safe to run it any further. Every one from the highest to the lowest accepts his *ultimatum*, and without question makes arrangements to carry out his order.

I have seen coaches so filthy that some one should have had the power to substitute a clean, well-ventilated car for the unclean one. How coaches shall be made clean is a problem of no small proportions, as we have shown that only a limited time can be allowed; and, therefore, to do good work, modern conveniences and mechanical ingenuity must be substituted in part for the manual labor now employed. Hot water and steam are our best disinfectants, deodorizers, and filth destroyers. It is also a well-known fact that surfaces superheated by dry or moist heat become dried and free from the odors of moist surfaces very much sooner than the same surface would if wet with cold water, which in cold weather is of great importance, as a car reeking with moisture incident to a washing in cold weather is about as uncomfortable and unhealthy an apartment as can be found.

Whether it will be necessary to bring all coaches that require cleansing within a reasonable distance of a stationary engine, in order to utilize steam from its boiler, I will leave to the practical railroad man; yet I will venture the suggestion

that the same result might be attained by attaching a hose to any locomotive near at hand, and which was not to be sent out for an hour or two. To carry a jet of steam into a urinal for a few moments dissolves all the salts deposited upon its surface, and the introduction of steam under twenty-five or fifty pounds pressure, in the corners and crevices of a closet for a moment will destroy the most virulent germ that is lurking there. How it shall be brought about is only a question to be settled by practical mechanics.

I am not making any claims at originality in this paper, but am rather striving to make the most of what may be found in any railroad yard. Let us use reason in all things ; and while these are matters that may seem humble when compared to some brilliant act of modern antiseptic surgery, yet the public are just as much interested in its success as they are hopeful that they will not need our services as surgeons. Now as the public become interested, we may be sure the management of our roads will not be far behind in their expectations that we will take cognizance of this work, for it is to us that they will look for suggestions. While we are looking after the lives and limbs in the interest of the employés, we should also have a thought for the health and happiness of the passengers.—*Weekly Medical Review*, June 13th, 1891.

FIREPROOF BUILDINGS.

A PRACTICAL builder, in the *Philadelphia Record*, gives the following views on this subject. Iron, because of its malleable qualities, and granite, from its liability to crack when overheated, are just as dangerous and destructible in the event of a big conflagration as the lightest wood. Yet a real fireproof building is not, on that account, an impossibility. The invention of so-called hollow bricks has produced a means by which houses may, with proper precaution, be rendered impregnable to the devouring element. Of course, if a building is to be quite fireproof it must be constructed of materials that are not only incombustible, but also perfect in respect of tenacity and durability when subjected to excessive heat. For this purpose we must suppose the outer wall of our model house to be of

brick, and, while iron will, of course, remain essential for girders, columns and beams, these must be incased in from two or three inches of burnt clay material, so that every particle of ironwork shall be covered. This brick-work is thoroughly fireproof, but to insure still greater security the bricks must contain cavities in their centres, which will not only increase their lightness, but, by furnishing air ducts, act as insulators that will stay the progress of heat.

The partitions of this ideal building must rest on fireproof floors and be made of burnt clay blocks. Furring blocks of the same material must be substituted for the usual wooden furring along the inside of the exterior walls, and the roof must be of thick, porous terra-cotta bricks. The floors are, of course, a very important feature of the structure; but if they are made of rolled iron beams, properly spaced and thoroughly protected by hollow burnt clay arches, I warrant they will be absolutely invulnerable. Wood-work, of course, may catch fire; so may the curtains, carpets, chairs, tables, and what not that fill the room. But it will be impossible for the flame to spread.

But there's still another and equally valuable virtue in hollow bricks. It is the immunity from cold and dampness which a building thus constructed enjoys. The air-cells in the centre of every brick absolutely prevents rain or moisture from permeating the walls. The roof, too, is rain-proof, and in the good time coming, when every well-regulated household will embody this excellent feature, there will be no such thing as water-soaked ceilings and rain-stained walls. Just as these bricks cannot carry heat, so they are a protector against cold. The air that is within them cannot by any means conduct the frigidity of the outside world into the home circle. Boreas will roar in vain around the chimney-pots of the family housed in a hollow-bricked snuggerly.

One thing more, these bricks are impervious to sound. Your neighbor may sing all day and you will never know it. Or the baby may squall in sixty different sharps and flats from midnight till the dawning, and you, soundly sleeping in the next room, will suppose the infant, too, in slumberland. The tones of tinabulating pianos and mediæval hand-organs can never penetrate through hollow bricks.—*Insurance Monitor*.

THE DEVELOPMENT OF THE PIG.

THE development of the pig is a triumph of art over nature. Nature's pig, the wild boar, is not a very gainly animal ; nature's pig, again, simply domesticated and fattened, in the form of a common farm pig, is little better than a necessary evil ; but nature's pigs from different quarters of the world, mixed together, remixed, and judiciously blended by the scientific breeder, eventually produce a creature which is a joy, if not exactly a thing of beauty, forever—or, at least, until it is made into bacon. It is absolutely painful to a man who knows what a pig ought to be, may be, and often is, to hear people who should know better say that they "hate pigs." Such people can have no eyes for form, or they would not speak thus of animals which can show the graceful curves of the best breeds of Berkshires, Chinese, and Yorkshires ; and there are enthusiasts who would even go so far as to say that they must be color-blind if they can so far forget the rich tones and tints of the butchered and "hung up" pig, in which certain celebrated Dutch artists have taken a keen delight.

Undoubtedly the British pig of the end of last century must have been an ugly, ill-favored-looking brute—indeed, many of his modern representatives are little better—but by degrees there came importations of Chinese, Siamese, Maltese, and Neapolitan pigs, which, if not altogether satisfactory in themselves, brought "corrective influences" to bear upon our native monstrosity. The native monstrosity, again, acted as a corrective upon the alien, and so we went on, breeding, crossing, selecting, effecting the survival of the fittest and the curing of the less fit, until we obtained those glorious pigs which are only so far short of perfection as to make us zealous in the hope of some day attaining to it.

It is mortifying to the Englishman to know that, while he was still content with a great, leggy pig, the South Sea Islands, on their discovery, were found to be well stocked with a small, black, short-legged pig. As to the Chinese, they have been far ahead of us for centuries, and in most of the

provinces of China pork is, at present, much more abundant than mutton. It is some consolation to reflect that America has been behind us, and that the pig is not indigenous to North America, although his first cousin, the peccary, is a native of South America. The Americans, however, have made up for lost time, and we have nothing in this country that can vie with the great pig-meat factories of Chicago. In respect to the treatment of pigs in other parts of the world, it is sad, when we look at our own refined and well-cared-for favorites, to remember that in some parts of India semi-wild pigs are allowed to work their own sweet will in the streets as scavengers. In short, they take the place of drains, and they go where they please in perfect safety, for nobody has the least desire to eat such evil-livers. Yet it is of faith among pig-fanciers that their pet is naturally a clean animal ; that he only rolls in mud for hygienic purposes ; that he hates a dirty sty, and that, if left to himself, he would feed almost exclusively on chestnuts, acorns, and truffles. Why, then, should we not piously believe that he even does this Indian scavenging business from motives of the purest unselfishness and self-sacrifice, to render the dwellings of filthy man habitable and healthy for him ?

A change of fashion has taken place of late in the modern British pig, not through the taste of the fancier, but through the more practical if less artistic demands of the bacon-curer. The fact is that curing has been revolutionized. Formerly the lean of bacon and ham used to be hard, unpalatable, and fearfully and wonderfully salt, while the fat, as fat, was good enough ; now, under the system known as "mild-curing," the lean is excellent. It may easily be understood, therefore, that during the dark ages of bacon-curing, the chief object of the pig-fattener was to produce the largest possible amount of fat to lean, whereas at present it is to produce the greatest possible proportion of lean to fat. There have been changes, again, in the ideal shape of the pig, and these have been brought about by the alterations in the prices given per pound in the market for certain portions of the pig's carcass. For instance, the shoulder and neck are now about the least valuable parts of his body, consequently the immensely developed crests and shoulders, which used to excite so much

admiration, are now odious in the eyes of the practical breeder. Without entering into the details of "sides of bacon," such as "prime streaky," "thin streaky," "middle of gammon," "fore-end," etc., we may remark that there are about seven distinct prices for the seventeen different parts of the "sides," to say nothing of the head and trotters.

If we were asked which modern breed was probably the most direct descendant of the aboriginal pig of this country, we should be inclined to say the Tamworth. This breed has been steadily increasing in favor during the last few years. The common idea of a Tamworth's color is dull red with black spots; but it varies from a deep, rich red to a brick-dust tint, and in some cases it is of a dark slate color. The uncultivated Tamworth is hardy, ugly, leggy, long-nosed, and slow in growth; the improved Tamworth is also hardy and long in the nose, but he puts on lean quickly and fat slowly, which makes him the pig of the period for curing on the modern system. The black Berkshire is still a very popular pig, and for many years he was generally liked better than any other, although he had had to make a hard struggle to overcome a strong prejudice which existed in certain localities against his color. This pig, as well as the Essex, was improved many years ago by a cross of Neapolitan blood. The probability that the Berkshire breed has been black for a very long period has been questioned. Black pigs with white points can be traced back for seventy years in Berkshire; yet it has been confidently asserted that the pig of the district used to be tawny with black spots. At any rate, crosses of Berkshire with white pigs frequently produce offspring with a certain amount of red, which shows that this breed, like the Tamworth, originally sprang from the old red pig of the country. The produce of a Berkshire sow by a white boar is almost always white, but, curiously enough, dark colors often appear in later crosses. The chief faults to be guarded against in buying Berkshires are light flanks, short, drooping quarters, some approach to legginess, unduly coarse hair, and deeply furrowed skin. They should not be marked with white except on the nose, forehead, tip of the tail, and feet; but if they have no white upon them at all, it is probable that they have a cross of Essex blood in them. The Essex is quite

black and is something between the Berkshire and small Yorkshire in shape. If not very well known, he is a very good pig and shows considerable breeding. It has often been contended that the large Yorkshire is the truest living representative of the aboriginal pig of the country. So far as his drooping quarters, large head, long nose, strength of bone, flat sides, and tendency to narrowness are concerned, we willingly admit it; but we cannot truthfully say that this enormous, white, farmyardy-looking pig is exactly our idea of a wild boar. A few years ago, pigs of this breed used to be fattened until they weighed, in some cases, as much as bullocks—one which was a winner at the Royal Agricultural Society's shows at Carlisle and Derby weighed nearly half a ton—but they are killed much younger now, and, being rather lean pigs until they reach a certain age, they are well suited to the present demands of bacon curers. The Small Yorkshire is a breed formed by crossing the Large Yorkshire with the Chinese. He represents the highest pinnacle to which art can attain in the production of fat, and for this very reason he does not meet with the approval of the modern curer. His breed, too, has been very much in-bred, with the usual results of delicacy and unproductiveness. It may be observed here that all breeds much crossed with the Chinese are less in favor than they were a few years ago. The Middle White Yorkshire is a variety of the Small White, and it may be that this breed has a great future before it. Thus far it is somewhat undefined in its form and uncertain in its produce. The Lincolnshire pig is, like the pike, "a voracious feeder," and it is large, lop-eared, and ugly. The common white pig of Scotland is a long-snouted, leggy animal something of the Large Yorkshire type, and a slow fatterer. Nevertheless he makes an admirable cross with the Berkshire. "Gallant little Wales" also has its pig, and from its red and black hue—plum-pudding color, as it is profanely called—it may claim to be descended from the aboriginal wild-boar which used to be hunted by those Welsh kings from whom nearly every Welshman claims to be descended. Both the Welshman and the Welsh pig have become a little mixed in the course of their long descent, and the pig is an exceedingly vulgar-looking beast, whose only value consists in his making a hardy out-cross with other breeds.

Whether Dr. Koch's cure will be applied to pigs remains to be seen ; but it is certain that they are subject to consumption, especially when much in-bred. Swine-fever is sometimes not inaptly called Hog-cholera, and measles is another disease very common among pigs. Like cattle, they sometimes have foot-and-mouth disease, and they are often troubled with rheumatism. Altogether pigs can scarcely be called very hardy animals, and the provoking part of the matter is that the higher bred they are, the more delicate, as a rule, they become. The coarser bred sows, again, are usually the most prolific.

If the pig is an animal of unblemished reputation, the same thing cannot invariably be said of his master. The records of the Royal Agricultural Society contain a series of indictments against pig-exhibitors which represent them as addicted to sinful tricks worthy of the lowest class of horse-dealers or the most dishonest of picture-dealers, and a year ago a hope was pathetically expressed in the journal of the Society for "a higher tone of morality" among them.

One great drawback to pig-breeding—and observe that this is not the fault of the pigs—is the violent fluctuation which is constantly taking place in their prices. When your bailiff urges you to sell because you have got "sadly too many," you get wretched prices, and the only consolation offered to you is that "pigs is very low." When pigs are "up," and you want to sell, you either find that you have none to spare, or else your bailiff declares that it would be "a thousand pities" to part with them now that "there's such a lot o' keep." An average pig fattens most quickly from the time he weighs 9 stone to the time he weighs 12 stone, and, in the present condition of taste in bacon, it pays best to kill him when he weighs about 12 stone. Sows should be fattened after they have produced a second or third litter, however great the temptation to have "just one more." "Oh that we were all as fit to die as that pig !" said the pious farmer ; but it is not so easy to say exactly when a pig is fit to die as some people suppose. In dismissing the subject, let it be said, to his credit, that the pig is the most economical meat-producer on a farm, and that he is about the only living creature about a gentleman's establishment that pays at all.—*Saturday Review.*

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION. SUPPLEMENT. (*Continued from page 64.*)

By Dr. H. R. STORER, of Newport, R. I.

SECTION V. *Drainage.*

(THE SANITARIAN, February, 1888.)

IN addition to the medals of De Lesseps, already given, there is a third.

1753. The Panama Canal. 1888. Gilt copper. 41 mm. Bom & Zoon Cat., September 2d-9th, 1889, No. 1473.

THE UNITED STATES.

1754. Obverse. Ceres before sheaves of wheat. N. Y. State Agr. Society. 1848.

Reverse. Awarded for Draining. 33. R. C. Davis Cat., January 22d-26th, 1890, No. 1886.

1755. There is a medal of Prest. Garfield, with device on reverse representing him as a boy on horseback, towing a canal-boat. It was figured by Haseltine.

ENGLAND.

1756. Thames and Severn Canal. 1795. Woodward, Twenty-eighth Cat., May 6th-7th, 1880, No. 770.

SCOTLAND.

1757. Crinan and Lancaster Canals. (John Rennie, The Engineer.) Cochran-Patrick, Medals of Scotland, p. 129, Nos. 58, 59.

BELGIUM.

1758. Canal of Louvain. 1753. Roettiers. *Méd. de Marie Thérèse*, No. 145.

1759. Neuzen and Ghent Canal. 1827. Braemt. Gold, silver, bronze. 52 mm. Coster Cat., 1885, Nos. 1067-8.

1760. Charleroi and Brussels Canal. 1832. *Ibid.*, No. 1208.

1761. Obverse. Bust of Louis XIV. (The Canal of Bruges.)

Reverse. Exergue : Ad Fossam Brugensem. M.DC.LXVII. Cat. des Poinçons, etc., p. 78, No. 144.

1762. As preceding, but larger. *Ibid.*, p. 79, No. 144^a.

The two last commemorate a battle near the canal.

1763. Canal from Pommerœul to Antoing. Silver. Chalon Cat., 1889, Nos. 625 and 1374.

1764. Canal from La Haine to L'Escaut. Bronze. *Ibid.*, No. 1304.

HOLLAND.

1765. Canal from Montfort and Linschoten to the Rhine. Silver. Schulman Cat., May, 1889, No. 1119.

1766. Leyden to Utrecht Canal. Volcker Cat., April, 1888, No. 769.

1767. Canal along the Zeyl, near Leyden. *Ibid.*, No. 931.

1768. Zwolle to Munster Canal. 1724. Fossa Aperta, etc. *Ibid.*, No. 1384.

1769. New Canal to Bois-le-Duc. 1741. *Ibid.*, No. 1452.

1770. Opening of the Great North Holland Canal. 1824. Bom & Zoon Cat., September 2d-9th, 1869, Nos. 1004-5.

1771. Do. of the Canal of Henegouwen. Braemt. 1826. *Ibid.*, Nos. 1033-4.

1772. Decree of building canal from Amsterdam to North Sea. 1862. Schulman Cat., May, 1889, No. 139.

1773. Opening of North Sea Canal. Ed. Geerts. *Ibid.*, No. 148.

1774. Schelde-Haine Canal. Tschiesche & Koder Cat., October, 1889, No. 1894.

1775. Drainage of the Lake of Haarlem. Elion. Schulman Cat., May, 1889, No. 806.

FRANCE.

1776. Canal from the Garonne to Cette.

Reverse. Maria juncta. Exergue : Fossa a Gar. ad port.

Setium. M.DC.LXVII. Cat. des Poinçons, etc., p. 79, No. 146.

1777. As preceding, but larger.

Reverse. Novum Decus Additur Orbi. Exergue : Maria juncta. M.DC.LXVII. *Ibid.*, p. 79, No. 146^a.

1778. Obverse. Bust of Louis XVI.

Reverse. Altera Utriusque Maris Junctio. Gatteaux F. *Ibid.*, p. 296, No. 48.

1779. Rheincanalisirung-Napoleon. Millin, 354 ; Hess Cat., December 5th, 1888, No. 887.

1780. The Canals of Paris. Canales.Undiqueversum.Effossi.MD.CCC.XXII. Cat. des Poinçons, etc., p. 416, No. 69.

1781. Opening of the Canal Marie-Thérèse. 1825. *Ibid.*, p. 449, No. 54.

1782. Canal of the Somme. Paris to the Sea. 1827-9. *Ibid.*, p. 450, No. 56.

AFRICA.

In addition to the Suez Canal medals, already mentioned, there is another.

1783. Obverse. View of the Canal, 1869, surrounded by the shields of all nations.

Reverse. Within wreath, inscription in French. White metal, 32. Frossard, Eighty-ninth Cat., December 26th-28th, 1888, No. 173.

SECTION VI. *Sewerage.*

(THE SANITARIAN, April, 1888.)

FRANCE.

1784. Obverse. Bust of Louis XIV.

Reverse. A female, upon a clean pavement, holding a lighted lantern. Inscription : Urbs Mundata (etc.) Exergue : M.DC.LXVI. Cat. des Poinçons, etc., p. 75, No. 134.

1785. As preceding, save that the female carries a full purse. Legend : Urbis Securitas Et Nitor. Exergue : M.DC.LXVIII. *Ibid.*, p. 83, No. 155.

1786. As above, but larger. Hupière F. Exergue : Providentia Opt.Pr.M.DC.LXIX. *Ibid.*, p. 83, No. 155^a.

1787. As above, save that the figure holds in one hand a level, and rests the other on a wheel. Legend : Urbs Novo

Lapide Strata. Exergue: M.DC.LXVIII. *Ibid.*, p. 83, No. 156.

1788. As above, with addition upon reverse of the initial N. *Ibid.*, p. 83, No. 156^a.

BELGIUM.

Sewerage is referred to by No. 1691, a civic medal of Brussels, which bears as a portion of its inscription: Travaux Intérieurs | D'Assainissement | De La Senne (etc.) Alvin. *Revue belge de numismatique*, April, 1888, p. 336.

1789. Travaux D'Assainissement (etc.) De La Ville De Bruxelles. Chalon Cat., Brussels, 1889, No. 957.

The subject is also referred to on No. 60, a medal of Charles Rogier of Belgium.

Under the present Section I mentioned the medals of cemeteries. That I was correct in doing so is corroborated by the following:

1790. The medal commemorating the removal, in 1777, of burial within the City of Breslau, and the increase thereby of protection to the lives of its citizens. Pfeiffer and Ruland, p. 172, No. 478.

1791. Obverse. Bust of Maria Christina, Archduchess of Austria, facing, and inscription.

Reverse. Between festoons of leaves and palm branches: Mortui | Urbibus | Eliminati | Morte. Veteri MDCCLXXXIV. Silver. Octagonal. Du Rosey Cat., 1883, No. 3129; Coster Cat., 1885, No. 891. Unknown to P. and R.

In this connection belongs Cremation, illustrated by ancient medals bearing cinerary urns.

1792. Communal Cemetery of St. Genois (Belgium). Chalon Cat., 1869, No. 1093.

1793. Tournay (Belgium).

Reverse. Aggrandiss^t Du Cimitière Du Sud (etc.). Wiener. Bronze. 32. In my collection.

There are also "tokens of presence" at funerals, issued at the towns of the Netherlands for the members of burial guilds. Volcker Cat., April, 1888, Nos. 2596, 2644-5-6.

Among funeral medals might have been mentioned the transport of the heart of Henry III. of France to the Church of St. Cloud. *Trésor de Num., Méd. Franç.*, xxxviii., 1.

SECTION VII. *Ventilation.*

SECTION VIII. *Diet.*

(THE SANITARIAN, April, 1888.)

CANADA.

Dr. Samuel Passmore May (1828-), of Toronto.

Dr. May received at the Paris Exposition, in 1878, besides a commemorative medal from the French Government, a gold medal (Grand Prix) for the Canadian authorities, and another as collaborateur, for a Food Collection. In addition, he received the decoration of Legion of Honor (for good deeds to the nation), and that of Officer of the Academy (for scientific merit).

THE UNITED STATES.

Dr. Ephraim Cutter of New York. "Flour our Proper Food," 1875; "Baked Beans," etc.; "Treatment of Consumption by Animal Food," 1876; "Cereal Food;" "Food in Uterine Fibroids," 1877; "Feeding Patients against the Appetite," New York, 1887, 12°.

Dr. Cutter has the gold medal of the Society of Science, Letters and Art, London.

Dr. N. S. Davis, of Chicago, has additionally published upon "The Preservation of Milk," 1855.

Dr. John Morris, of Baltimore, upon "Milk: Its Adulterations, Analysis" (etc.), *Maryland Medical Journal*, June 15th, 1882.

Dr. Benjamin Rush, "An Inquiry into the Relation of Tastes and Aliments to each Other," etc.; *Medical Inquiries and Observations*, vol. i.

ENGLAND.

Dr. Sir Theodore Turquet de Mayerne (1573-1655) wrote a work on Cookery.

1794. Obverse. Bust. Inscription: Th.De.Mayerne Eq.Aur. Baro.M. Bnae. 4 Reg.Gal.Et Angl.Archia^{os}.

Reverse. A winged globe upon an octagon, flanked by rosettes. Above this, a circle, within which two intersecting

triangles enclosing a radiant sun. In lower angles, A | I | E | I Above this, a serpent swallowing itself, and the figure of an alchemist. And still above, the doctor's cap, etc. Legend : Non.Hæc.Sine.Numine. By Nicolas Biot, 1625. 83 mm. Snelling, *loc. cit.*, pl. XIII., No. 4 ; Pinkerton, *English Medals*, pl. XIX., No. 4 ; Rudolphi, *loc. cit.*, p. 105, No. 39 ; Kluyskens, ii., p. 201 ; Duisburg, p. 217, dlxxvii.; Hawkins, Franks and Grueber, i., p. 241, No. 8.

GERMANY.

Dr. Justus von Liebig. "Chemische Untersuchung über das Fleisch," etc., Heidelberg, 1847, 8°. Already given. Nos. 1718 and 1719.

An allegorical medal applied to the City of Utrecht, "Fromage D'Hollande," may be mentioned here. Bom & Zoon Cat., December, 1888, Nos. 811-12.

In regard to medical Temperance medals, Dr. N. S. Davis, of Chicago, published additionally: "Does the Use of Alcoholic Drinks Increase Men's Capability of Resisting Cold?" *Analyst*, ii., p. 442 ; "Experimental Inquiries and Observations concerning the Effects of Alcoholic Drinks and Other Substances on the Temperature of the Human Body." *N. W. Medical and Surgical Journal*, 1851.

Dr. Benjamin Rush wrote "Sermons to Young Men on Temperance and Health," 1770 ; "Observations upon the Influence of the Habitual Use of Tobacco upon Health, Morals and Property ;" "On Diseases Caused by Drinking Cold Water," *Medical Inquiries and Observations*, vol. i.

Dr. Marmaduke Burr Wright (1803-79), of Cincinnati. "Drunkenness and Insanity," 1845 ; "Drunkenness : Its Nature and Cure ; or, Asylums for Inebriety," 1859.

Dr. Wright received a large and elaborate gold medal, engraved, from the Ohio State Medical Society in 1854, for an important contribution to Obstetric Practice.

There are the following additions to the subordinate list :

1795. Obverse. Well curb, etc., much as in No. 383.

Reverse. Clasped hands. Within oak boughs, pledge to abstain "Except For Medicinal (etc.) Purposes." 1856. Bronze. 21. In my collection.

1796. Obverse. American Juvenile Temperance Society, New York.

Reverse as preceding. Bushnell, *loc. cit.*, p. 104, No. 10. In my collection.

1797. Obverse. Child weeping above a prostrate drunkard, who has glass in hand, etc.

Reverse. Inscription very similar to preceding. Brass. 18. In my collection.

1798. "Except when prescribed by a Physician." Albany Catholic Total Abstinence Association, 1840. White metal. 26. Communicated to me by Mr. L. H. Low, of New York.

1799. Obverse and reverse like No. 390, save: Catholic Total Abstinence Society, Approved by the Right Rev. John Hughes, D.D. Bushnell, *loc. cit.*, p. 105, No. 12.

1800. Reverse and pledge like No. 389. St. Dunstan Total Abstinence Society. Charlottetown, P. E. I., 1841. I have impressions of this from Mr. R. W. McLachlan, of Montreal.

1801. Obverse. St. Michael, etc. Legend: Who Is Like Unto God

Reverse. "Unless by | advice of physician or with the | Permission of the President | when deemed medicinally | necessary (etc.). Metropolitan Total Abstinence Society, Dublin, Ireland. In my collection, from Mr. McLachlan. Temperance doctrines have even circulated as coins.

1802. Obverse. Temperance Halfpenny. 1840. Health. Peace. Competence. Happiness.

Reverse. Children Trained In Habits of Temperance Will Never Become Drunkards. Neumann, *loc. cit.*, No. 25,691.

In connection with Nos. 395 and 396, and exclusive of tobacconists' tokens, there are

1803. La Société contre l'abus du tabac. Chalon Cat., 1889, No. 1185.

1804. Obverse. Crowned arms, and inscription.

Reverse. Justice, upon a section of the globe. Inscription in Spanish (Issued by the Royal Cigar Manufactory "La Hernandez," of Havana). Gilt, bronze. 37. Woodward, One Hundred and Fifth Cat., February 4th-5th, 1889, No. 132.

There are a few dietary tokens that may be mentioned.

1805. La Cuisine Populaire. Ghent. Chalon Cat., 1889, No. 545.

1806. Bovril. London & Paris. Le Plus Merveilleux Aliment Du Siècle. In the Wright collection.

1807. Obverse. Crowned oval shield with floreated cross. Ville De Bourg. Ain | 1855

Reverse. Association Alimentaire | Vin Copper. 13. In the Wright collection.

1808. Obverse. A cow, with bell, to left.

Reverse. 1 Liter | Schweizer | Milchkur- | Anstalt | Fickardstrasse 22 Edges milled. Brass. 14. In my collection.

1809. Similar to the last, save $\frac{3}{4}$ Liter. Edges milled. Brass. 12. In my collection.

SECTION IX. *Famine.*

(THE SANITARIAN, July and August, 1888.)

FRANCE.

1810. Obverse. The Hebrew word for deity, amid clouds, from which rain and flames descend upon several prostrate persons. Legend: Armis. Rvat. Cœlestibvs. 1598

Reverse. Three men beating against the sky with clubs. Legend: Cœlvm. Stolidvs. Qvi. Territat. Armis. Edges milled. Copper. 19.

Unmentioned by Pfeiffer and Ruland. In the possession of the Messrs. Chapman, of Philadelphia.

1811. Similar to No. 469, but larger. Cat. des Poinçons, etc., p. 65, No. 103^a.

GERMANY.

The famine tokens of Thuringia, including those of Altenburg, Arnstadt, Coburg, Erfurt, Gotha and Weimar, in addition to being included by Messrs. Pfeiffer and Ruland in their "Pestilentia In Nummis," are described by the former of these gentlemen in his "Die Thüringischen Pest-und Theurungs-Münzen" (*Correspondenz-Blätter des Allgemeinen ärztlichen Vereins von Thuringen*, 1882, No. 4).

1812. Obverse. An angel gives drink to a prostrate female with two children at the foot of a dead tree. Reverse.

Im Jahre 1847 Galt In Schlesien D. Sack Oder 2 Pr: Scheppel*
In field : Weitzen 11 Rt. | Roggen 10. | Gerste 8. | Hafer 3½
| Erbsen 9. | Kartoff : 2. Tin. 28. Unmentioned by Pfeiffer
and Ruland. In my collection, from Dr. Josef Brettaufer, of
Trieste.

1813. Similar to No. 610 (Wurtemberg), save that in both
places there is K. R. instead of Kr. In my collection. Un-
mentioned by P. and R.

ENGLAND.

1814. Nelson St. (Manchester) Cooking Depot. Brass,
tin. Battey, *loc. cit.*, i., p. 125, No. 709. Issued during the
Cotton Famine. Unmentioned by P. and R.

SCOTLAND.

1815. The floods at Moray. 1829. Cochran-Patrick, *loc.*
cit., p. 169, pl. XXXIII., fig. 4. Unmentioned by P. and R.

HOLLAND.

1816. Obverse. Head of King Willem II. Wiener.
Reverse. An allegorical group. Inscription : Orange En
Nederland Bij Den Watersnood. 1861. Bronze. 40. In
the possession of the Messrs. Chapman, of Philadelphia.

SECTION X. *Epidemics*, generally considered.

(THE SANITARIAN, November, 1888.)

ENGLAND.

Dr. Richard Mead.

(699.) The design of an infant and serpent upon the re-
verse, and the legend, were taken from a vignette at the end of
his treatise on poisons, 1745, where the poison of the viper is
especially discussed. The month (1754) of his death is given
as February upon the medal, but upon a portrait engraving of
Mead loaned me by Dr. George D. Hersey, of Providence,
R. I., it is stated as January. In addition to the authorities
quoted as describing this medal, there are : Skaife, "On
British Medals of a Recent Period," *Proceedings Manchester*
Numismatic Society, 1868, part VI., figured, and 1869, part

VII., p. 152; Hawkins, Franks and Grueber, *loc. cit.*, ii., p. 675, No. 389. There is a second medal of Dr. Mead.

1817. Obverse. Bust, in loose mantle, to right. Below: L. C. Wyon Sc. Inscription: Richard Mead M.D.

Reverse. Salus, with serpent, etc. Legend: Mereri Medendo. Exergue: S^t Thomas's Hospital. L. C. Wyon. Sc. Bronze. Rare. *Ibid.*, ii., p. 675, No. 389.

Prize medal, first given in 1875, for special practical examination in Medicine, Pathology, and Hygiene.

The Plague.

(THE SANITARIAN, November, 1888.)

HOLLAND.

Peter Adrian Van De Werf (1529–1604), of Leyden.

As Burgomaster during the siege of 1574 he was conspicuous in his zeal toward checking the epidemic.

(744.) I previously mentioned this as a token. It is, however, worthy description as a medal.

Obverse. Bust, to right. Beneath: J. Sneltzing. F. Inscription: Petrus Adriani Werfius. Nat: L(eyden): 1529. Obit 1604.

Reverse. Beneath a crossed palm and laurel branch, encircled by a serpent swallowing itself: Dits Vande Werf diepal | Dus binne Leidens wal, | Voorkerk en godsdienst stond: | En dempte met zyn mond | Baldeüs oorlogslist | Pest honger burgertwist: | En rukten uit dien brand | De vryheit van het land. I. D. F. Below, a view of the city. Silver. 31. 47 mm. P. and R., *loc. cit.*, p. 90, No. 273.

1818. Similar to the preceding, but without engraver's name on obverse. Silver. 31. 47 mm. Excessively rare. Unmentioned by P. and R. In my collection, from Dr. Brettauer, of Trieste.

FRANCE.

Dr. François Charles Hugues Laurent Pouqueville (1770–1838). "De febre adeno-nervosa seu de peste orientali," Paris, 1803, 8°.

1819. A bronze uniface. This was in Rudolphi's collection. It was mentioned in a MS. note to his own copy, which

I now own, of his last edition (1829). This copy must have also been seen by Duisburg, for he quotes the note in question upon p. 69, clxxvi., of his own work.

GERMANY.

Dr. A. Q. Rivinus (1652-1723), of Leipsic. "Die Pest, ihrer Natur, Ursachen und die Mitteln sich dafür zu bewahren und zu curiren." Leipsic, 1682, 8°, and 1714.

1820. Obverse. Bust. Inscription: Augustus Quirinus Rivinus.

Reverse. The city and its coat of arms. ForMet Sors AeDes. ConCors VrbI sIt IrIne. | Coss(Consulibus). SEN-ATui. & CIVibus SACRVM. | FIT PhILVres AVgVst QVIRIN RIVINVs In Vrbe Rector FI^t QVater & TeMporIs OrDo NoVVS. Exergue: Poni. Curavit. ALMAE LIPSiae. SACRVM.

Kundmann, Verzeichniss von Gelehrten in Münzen, p. 54, Nos. 681-82; Lesser, Besondere Muntzen, ii., p. 84; Rudolphi, p. 135, Nos. 563-64; Kluyskens, ii., p. 378, Nos. 1-2; Duisburg, p. 119, cccxvii., 1.

1821. Obverse similar, but reverse slightly different. Lesser, *loc. cit.*, p. 84; Duisburg, cccxvii., 2.

There has been much confusion about these two medals, owing to authors having blindly followed Rudolphi's very imperfect description of the first. Though Duisburg was aware that Lesser had described it, he failed to consult the work and to appreciate that much of the inscription was in chronogram.

1822. Obverse. Three shrubs in bloom. Legend: Con-junctio Felix.

Reverse. Regnante Friderico | Augusto | Rege Pol. Et El. Sax | Fundata | A | Friderico Bellic. | An. MCCCCIX. IV Dec. | ACaDeMIa PhILyrea | IVbILat (1709). Beneath: W(ermuth). Upon edge: Rectore Rivino Medicinæ Profes-sore * * * Silver. Rüppell, *loc. cit.*, p. 38.

ENGLAND.

1823. There is a modern imitation of No. 739^a. (THE SANITARIAN, January, 1890.)

Obverse. Queen Elizabeth.

Reverse. Phoenix amid flames, etc., referring to The Plague of 1574. Nicholls is upon the neck of the Queen. Hawkins, Franks and Grueber, *loc. cit.*, i., p. 125.

To French Plague tokens there should be added :

1824. Reverse. Peste. De. 1720. A. Belzunce. Marseille. Toujours. Reconnaisante. Bronze. Chaffer's Cat., London, 1755, p. 118, No. 3095. Unmentioned by P. and R. At the time indicated, R. R. Henri Xavier Belzunce was Bishop of Marseilles.

Small-pox.

(THE SANITARIAN, February, 1889.)

ENGLAND.

There exist four medals upon the recovery of Queen Elizabeth from small-pox.

1825. Obverse. Crowned bust, to left. Legend : Posui. Deum. Adiutorem Meum. i. 5. < . 2. (1572).

Reverse. A hand from clouds shaking a serpent into a fire. Legend : Si. Deus. Nobiscum. Quis. Contra. Nos. (This same reverse exists with a medal of Philip II. of Spain. Van Loon, ii., p. 84.) Silver. Hawkins, Franks and Grueber, i., p. 116, No. 47.

1826. Obverse as preceding.

Reverse. Device as on preceding. Legend : Nocebit. Nihil. Cui. Non. Nocuisse. Debet. Acts. XXVIII. Silver, lead. *Ibid.*, p. 117, No. 49.

1827. Obverse as before. By Jacopo Primavera.

Reverse plain. *Ibid.*, No. 50.

1828. Obverse as before.

Reverse. Inscription : Semper - Invicta. Silver, electro. *Ibid.*, p. 117, No. 51.

Vaccination.

(THE SANITARIAN, March, 1889.)

Dr. Ephraim Cutter, of New York, already mentioned under Section VIII., Diet. "Experiment with Animal Vaccination," 1860 ; "Partial Report on the Production of Vaccine Virus in the United States," 1872.

There are two additional French vaccination medals.

1829. Obverse as reverse of No. 964.

Reverse plain. Silvered bronze. 32 mm. Millin, pl. XXIX., No. 93; Kluyskens, ii., p. 112.

1830. Obverse as that of No. 964.

Reverse as that of No. 968. Silver. 25 mm. *Ibid.*, ii., p. 113.

Cholera.

(THE SANITARIAN, April, 1889.)

THE UNITED STATES.

Dr. S. A. Cartwright, of New Orleans, already referred to. "Some Account of the Asiatic Cholera," etc., Natchez, 1833, 8°; "The Pathology and Treatment of Cholera," New Orleans, 1849, 8°.

Dr. Cartwright was the recipient of a gold vase, costing \$1000, from the planters of Adams County, La., for his services during the cholera epidemic of 1833.

Dr. Elisha Harris, of New York, already mentioned. "Cholera Prevention," etc., New York, 1867; "Practical Conclusions Concerning Cholera," American Public Health Association Report, 1873. Cambridge. 1874, 8°.

Dr. James Wynne, of New York. "Asiatic Cholera in the United States in 1847," a paper prepared at the request of the British Government. His medal therefor has already been mentioned, No. 1484.

ENGLAND.

Dr. E. A. Parkes. An additional paper was "An Enquiry into the Bearing of the Earliest Cases of Cholera which Occurred in London during the Present Epidemic," London, 1849, 8°.

SCOTLAND.

Sir James Y. Simpson, of Edinburgh. He also wrote "The Contagiousness of Cholera," *Edinburgh Medical and Surgical Journal*, April, 1838; *Edinburgh Monthly Journal of Medical Science*, February, 1849.

FRANCE.

Dr. Antoine François Hippolyte Fabre (1797-1853 [1854, Index Cat., S. G. O.]), of Marseilles. "Du Cholera-morbus," etc., Paris, 1832, 12°; "Cholera-morbus. Guide," etc., Paris, 1854, 8°.

He received a medal from the French Institute in 1833.

There is also :

1831. Obverse. Head of Napoleon III., to left. Caqué.

Reverse. In French; Reward, Cholera 1854. To Mr. Androuzewicz. Upon band: Massilia Civitas. Exergue: Caqué. Silver. 32. Sampson Cat., June 17th-21st, 1889, No. 1548. Unmentioned by P. and R.

POLAND.

1832. Obverse. Bust of saint, to left, with crossed hands: the right holding a pilgrim's staff and suspended pouch. Inscription: S. Rochu Modl Sie Za Mami. | By Od Nas Bog Cholery Odwrocie

Reverse. The Virgin, crowned, with crossed hands, rays, and stars. * Matka Milosierdzia. Below: W | Warsiawic Brass. Oval. 18 x 21 mm. In the Fisher collection. Unmentioned by P. and R.

Yellow-fever.

(THE SANITARIAN, June, 1889.)

THE UNITED STATES.

Dr. S. A. Cartwright, of New Orleans, already mentioned. "The Yellow-Fever of Natchez," *New Orleans Medical and Surgical Journal*, March, 1857.

Stephen Girard (1750-1831), of Philadelphia.

During the epidemic of 1793-98 he performed the duties of physician, and, despite his great wealth, of nurse to the sick.

1833. Obverse. Statue. Inscription: Stephen Girard

Reverse. R. Lovett Jr.'s card. White metal, copper.

20. In my collection.

For further particulars concerning the Rush medals, see

Storer, "The Medals of Benjamin Rush, Obstetrician," *Journal of the American Medical Association*, September 7th, 1889.

BRAZIL.

1834-5-6. Obverse. Inscription: Epidemia | De | 1855.
Reverse. Ao Ex^{mo} Senhor | Visconde De Bacpendy | Os
Campistas | Agradecidos. Bronze. 37 mm.

Meili, "Die auf das Kaiserreich Brasilien bezüglichen Medaillen," Zurich, 1890, p. 21, No. 203, pl. XXXIV.

Conferred for services during Yellow-fever. Similar medals were also given to Visconde de Condeixa and D^{or} Jozé Mancel da Costa Bastos, in each instance the names being apparently struck and not engraved.

FRANCE.

Dr. Étienne Pariset published, in addition to what has been mentioned, "Verlauf des gelben Fiebers," Vienna, 1822, 4°; "Eclaircissemens, etc., en réponse aux allegations etc., contre la commission médicale envoyée a Barcelonne en 1821," Paris, 1827, 4°.

A list was given of the recipients of the gold medal, No. 1075, of the Howard Association of Norfolk, Va., in 1855. Besides the physicians named the medal was conferred upon a devoted lady from New York, Miss Annie M. Andrews, who acted as nurse to the sick during the epidemic. (Appleton's Cyclopædia of American Biography.)

(1266.) I had been informed that Captain and Surgeon James Y. Porter, U. S. A., had received a medal for his services during the recent Yellow-fever in Florida. Surgeon Porter has, however, written me that his memorial from the Auxiliary Sanitary Association of Jacksonville was not a medal, but a gold watch, charm, and chain.

Typhus.

(THE SANITARIAN, September, 1889.)

Dr. Rohé, of Baltimore, informs me that No. 1084, the medal to Drs. Keirle and Maughlin, from the Baltimore City Almshouse, was not struck, but wholly engraved.

Typhoid.

In addition to No. 1099, an English medal upon the recovery of the Prince of Wales from Typhoid, there are the following :

1837. Obverse. Group of the Queen, Prince Albert, Britannia, and the City of London, the latter pointing to a temple in the rear. J. S. & A. B. Wyon Sc. Legend : I was glad when they said unto me Let us go into the House of the Lord.

Reverse. The interior of St. Paul's Cathedral, with crowds of people. At left, upon a scroll : National Thanksgiving | St. Pauls London Upon a perpendicular bar : For The Recovery Of To the right, upon the bar : H. R. H. The Prince Of Wales Bronze. 49. 77 mm. In the Fisher collection. Unmentioned by P. and R.

1838. Obverse. The exterior of St. Paul's Cathedral. Exergue : W. B. Taylor. London.

Reverse. A laurel wreath. Inscription : National Thanksgiving For The Recovery Of H. R. H. The Prince Of Wales. — | St Paul's | Cathedral | Feb:27. | 1872 | — White metal. 22. 35 mm. In the Fisher collection. Unmentioned by P. and R.

Intermittent-fever.

(THE SANITARIAN, September, 1889.)

Dr. Francesco Puccinotti (1794-1872), of Sienna. "Storia della febbre intermittenti perniciosa di Roma negli anni 1819-21," Napoli, 1828, 8°.

1839. Obverse. Bust, to right. Beneath : A. Pieroni F. Inscription : A Francesco Puccinotti Urbinate. Below : B. Trompeo Promoveva.

Reverse. Gli Ammiratori—Siena Settembre M.D.CCC.LXII. Below : the staff of Æsculapius. Bronze. Duisburg, Suppl. II., p. 6.

Diphtheria and Influenza.

(THE SANITARIAN, September, 1889.)

Dr. Samuel Bard (1742-1821), of New York. "Angina

Suffocativa," *Transactions of American Philosophical Society*, 1771.

Dr. Bard received the gold botanical medal from the University of Edinburgh.

Dr. S. A. Cartwright, of New Orleans, already mentioned. "Malum Egyptiacum, Cold Plague, Diphtheria or Black Tongue," *New Orleans Medical and Surgical Journal*, November, 1889.

Phthisis.

(THE SANITARIAN, September, 1889.)

THE UNITED STATES.

Dr. Cartwright, of New Orleans, as above. "The Treatment of Pulmonary Consumption." *Ibid.*, November, 1857.

IRELAND.

Dr. Richard Carmichael (1779-1849), of Dublin. "An Essay on the Nature of Scrofula," London, 1810, 8°.

His medal, No. 1141, has already been described (THE SANITARIAN, January, 1890).

FRANCE.

Dr. Étienne Lanthois (1767-1826). "Phthisie Pulmonaire," Paris, 1822. His medals have already been given, Nos. 1163 and 1164.

Venereal Diseases.

(THE SANITARIAN, November, 1889.)

Dr. Robert Barker (-1745), of London.

1840. Obverse as in his other medal, No. 1140.

Reverse. Præses Societatis Regiæ Londinensis. 1744. Bronze. 53 mm. Hawkins, Franks and Grueber, *loc. cit.*, ii., p. 589, No. 233.

This is a mule, with reverse of the medal No. 910, of Sir Hans Sloane. It conveys a very serious error, as Dr. Barker, although a Fellow, was in reality never President of the Royal Society of London.

Dr. Richard Carmichael, of Dublin, already mentioned. In addition to the publications given, there are the following : "Summary of Mr. Carmichael's Views," etc., Dublin, 1838, 8° ; "Clinical Lectures on Venereal," Dublin, 1842, 8°.

Dr. John Hunter (1728-93).

In addition to the medals already given there exist two others.

1841. Obverse. Bust, facing. Inscription, at right : John Hunter.

Reverse. St. George's Hospital, with figures supporting a female patient, in front. Over right-hand figure : ΑΝΔΡΑ Δ'ΩΦΕΛΕΙΝ | ΚΑΛΛΙΣΤΟΣ | ΠΟΝΩΝ. Exergue : St George's | Hospital Below : L. C. Wyon 1850 Bronze. 55 mm. Cochran-Patrick, *loc. cit.*, p. 110, No 32*, pl. XXI., fig. 4 ; *ibid.*, *Numismatic Chronicle*, xx., p. 261.

1842. Obverse. Bust, etc.

Reverse, in seven lines : In Academ. Glasguens (is). Facultate Medica Discipulus Ingenio Ac Labore Insignis Præmium Hocce Merito Consecutus Est. Silver, bronze. 70 mm. *Ibid.*, p. 153, No. 12*.

The reverse of this medal is common to those of Drs. William Cullen, William Hunter, and Joseph Black, all of the University of Glasgow.

Dr. Hermann Boerhaave, of Leyden.

1843. Similar to No. 1148, save that the name of engraver is nearer to bust. This, as well as the other, is in my collection. It was unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell.

Scurvy.

(THE SANITARIAN, January, 1890.)

THE UNITED STATES.

Dr. M. B. Wright, of Cincinnati, already mentioned. "Scurvy, as it Appeared in the Ohio Penitentiary in 1835," *Western Quarterly Journal of Practical Medicine*, June, 1837.

ENGLAND.

Dr. Richard Mead, of London, previously quoted. "Discourse on the Scurvy," Medical Works, 1762.

Epizootics.

(THE SANITARIAN, January, 1890.)

FRANCE.

Dr. Antoine Portal (1742-1832), of Paris. "Observations sur la nature et sur le traitement de la rage," etc., Yverdon, 1779, 16°; "Bemerkungen über die Natur und Heilung der Wuth von Biss toller Thiere," Leipsic, 1782, 12°.

1844. Obverse. Bust. Beneath: L. Dubour F. Inscription: Antonius Portalis.

Reverse. Staff of Æsculapius. Inscription: Anatomia Pathologica Artis Medicæ Lux. Bronze. Duisburg, p. 68, clxx.

1845. Obverse. Bust. Beneath: 1809-10. Inscription: A. Portal Galliacensis Med. Par. Acad. Præses. Armorial shield, surmounted by cap, and with pendent decoration.

Reverse. Legend: Servat Et—Perficit. Silver. 18. 23 mm. Suppl. Hist. métallique de Napoléon, pl. LXXI., No. 456; Rudolphi, p. 126, No. 524; Kluyskens, ii., p. 320, No. 1; Duisburg, p. 91, ccclxi., 1. In my collection.

1846. Obverse as the preceding.

Reverse. A cock. Beneath: Præses Hon. Et Perp. Cœtus Academ. Medic. Paris.—Servat Et Perficit.—Below: a serpent drinking from a chalice. 1818. Inscription: Regis Archiattrorum Comes. Silver, bronze. 18. 23 mm. Rudolphi, p. 126, No. 525; Kluyskens, ii., p. 320, No. 2; Duisburg, p. 91, cclxi., No. 2.

To the medals of the Societies for the Protection of Animals there are several to be added.

SCOTLAND.

* 1847. Obverse. Arms of Scotland. Inscription: Scottish Society For The Prevention Of Cruelty To Animals | Inst. MDCCCXXXIX Below: A. Kirkwood & Son, Edinburgh.

Reverse blank. Silver. 52 mm. Cochran-Patrick, *loc. cit.*, p. 148, No. 52*, pl. XXX., fig. 10.

BELGIUM.

1848. Obverse. Within a beaded circle a crowned shield, upon which a rampant lion, to left. Beneath, upon a band : L'Union Fait La Force Inscription : Royaume De Belgique | *

Reverse. 50 : Anniversaire De L'Independance Nationale | * 1880 * Within raised circular field : Souvenir | Du | Congrès | Vétérinaire | Tenu A | Bruxelles Bronze. 16.

GERMANY.

1849. Obverse. Within field : Grausamkeit | Gegen Thierte | Verhärtet Das Gemüth | Auch Gegen Die | Menschen—

Reverse. Within a wreath bound by fillet : Als | Auerken-
nung | erwiesener | Humanitaet | vom | Vereine Gegen
Thier- | Quaelerey | in | München. Bronze. 26. 40 mm. In
my collection.

SWITZERLAND.

1850. Obverse. A crown of oak and laurel united by ribbon. Inscription : ∴ Protection Des Animaux ∴ Exergue : Union Romande.

Reverse. A female caressing a dog ; at her right, a horse, and at her left, a cow. Below : E. Lossier, Inv. Hugues Bovy F. Legend : Humanite * Douceur Exergue : Justice 51 mm.

Mayor. *Bulletin de la Société Suisse de numismatique*, ix., p. 23, pl. I.

1851. Obverse. Device as in preceding. Inscription : ∴ Société Genevoise ∴ Exergue : Pour La Protection Des Animaux

Reverse. Arms of Geneva. Ant. Bovy Exergue : Post. Tenebras.Lux. 51 mm. *Ibid.*

1852. Obverse. A person caressing a horse, and leaning against an ox. Inscription : Société Vaudoise Pour La Protection Des Animaux. Durussel Fec.

Reverse. A crown, partially covered by two branches of rhododendron, tied by ribbon. 43 mm. *Ibid.*

(To be continued.)

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

THE USE OF THE FLESH OF POISONED ANIMALS has been studied by Schmidt-Mülheim with a view to determine whether if eaten by men it would be injurious. As reported in the *Revista Internazionale d'Igiene*, of Naples, for June, 1891, it may be used without any danger whatever. Many savage races constantly use the flesh of animals that have been killed with poisoned weapons, and have never been injured by that means.

Harms has proved that the flesh of animals that have been poisoned with nux vomica and with tartarized antimony is not at all hurtful ; Feser has demonstrated the same fact in regard to strychnine and eserine ; Spallanzani, Zappi, and Sonnenschein have done the same for arsenic.

Froehner and Knudson have made some experiments for this purpose with strychnine and with eserine. They fed dogs with large quantities of mutton poisoned with strychnine and eserine, and they found that no injury whatever was done to the animals. Besides, they themselves eat some of the poisoned meat and drank soup made from it, and found that the flavor was good and had no injurious effects whatever on the system.

In regard to the alleged injurious effects caused by the meat of animals poisoned with hellebore, and which had eaten belladonna leaves, the authors have shown that the accounts published in this regard have not been proved and require further tests.

The *Revista* says that in the interest of meat inspection, it is desirable that experiments should be made with other poisons.

"PLEURÉSIES MÉTAPNEUMONIQUES" is the subject of an interesting discussion in the Société Médicale des Hôpitaux.

reported in a recent number of *La Gazette Hebdomadaire*. This form of pleurisy is developed during the period of resolution. Is this form of pleurisy always purulent, insidious, and dangerous, as Woillez believes? Is it sero-fibrous and benign, as Troisier supposes?

There is always a certain amount of pleurisy with every case of pneumonia; this is the opinion of Gubler and also that of Rendu. When métapneumonic pleurisy becomes purulent, it always yields to simple puncture, and pleurotomy is rarely necessary.

At the same session of the Société Médicale des Hôpitaux M. Netter introduced the subject of "Empiême Métapneumonique." The *Gazette Hebdomadaire* takes the following characteristics of the disease, with which the majority of the profession are far from being familiar, from the *Semaine Médicale*:

Metapneumonic empyema generally follows severe and tedious cases of pneumonia. It is most frequent in persons under thirty years of age, and is most frequently met with in countries situated to the north. Generally, metapneumonic empyema occurs at certain intervals, and these are observed when pneumonia is unusually frequent and serious.

The pus in these cases of empyema is thicker than usual, greenish, creamy, and slimy. It contains very little serum. False membranes of a fibrino-purulent character float in the liquid. Membranes of the same nature line the folds of the pleura, and may cause enclosures by adhesion and the encysting of the effusions. In the greater number of these cases the lung is but little altered, and readily regains its physiological characteristics when the effusion disappears.

Metapneumonic empyema begins before the end of the pneumonia in more than a third of the cases. In the other cases it does not appear until after the resolution.

HISTERO-TRAUMATISM, so called, has been pointed out by MM. Debove and Rémond, of Metz, in the de-compression (relief from the extraordinary compression) of workmen when they leave the diving-bell.

A workman removed suddenly from the unusual amount of compression was seized with convulsive attacks and paralysis.

This was followed by hemianæsthesia and contraction of the field of vision.

The traumatism appears in this case to have caused the hysteria, for the man had not in any way previous to the present attack presented any symptoms of nervous trouble.

MM. Debove and Rémond do not think it necessary always to admit the existence of gaseous embolism as the cause of the paralytic attack which may follow those accidents, due to rapid changes that take place in persons who work in diving-bells.

According to the authors of this communication, the hypothesis would explain the sudden cure of accidents in appearance grave and in existence for some time.

THE CONDITIONS OF THE VISUAL APPARATUS IN THOMSON'S DISEASE has been studied recently by M. Raymond, who says the characteristic motor troubles affect the lids and the special muscles of the eye; the latter may be hypertrophied to a remarkable degree. The accommodation is not disturbed, and the muscles indirectly involved in the accomplishment of this act may be excluded in such cases. This result depends on the anatomical structure of the ciliary muscles, for it is known that the muscles under voluntary control, the striated muscles alone, are the seat of muscular disturbance in Thomson's disease.

Ambliopia and transient amaurosis may follow as a consequence of spasmodic contractions of the muscles of the eyes, whether isolated or combined with spasmodic movements of the muscles of the neck.

THE ETIOLOGY OF CEREBRAL HEMORRHAGE has been the subject of a very interesting communication by Mendel to the Medical Society of Berlin. The *Gazette* copies the report from the *Mercredi Médical*:

"In a great many cases the symptoms of cerebral hemorrhage are the same; slight inequality of the pupil, slight facial paralysis, deviation of the tongue, motor hemi-paresis, sometimes with contraction and increased reflex action, etc. These symptoms lead to the inference that the hemorrhage generally occupies a very limited space, that of the striated body and the

thalamus opticus, and, indeed, in a statistical table, including 386 cases of cerebral hemorrhage, the effusion occupied this region in 301 of the cases; in another statistical report by Rosenthal the corpus lenticulare was the seat of the hemorrhage 70 times in 105 cases of cerebral apoplexy.

“In such cases the vessel ruptured is usually the artery of the corpus striatum, or, more exactly, the anterior branch of that artery, called by Charcot the hemorrhagic artery.

“How can this regular and almost constant localization be explained?

“Healthy arteries are not easily ruptured. According to Worm-Müller, one artery may be able to resist a pressure double or triple that which is normal.

“The rupture is not produced until the sudden increase of tension is caused in an artery already diseased; as to the pathological condition of the artery itself, it was noted by Cruveilhier, and later has been pointed out by Virchow, who gave it the name ampulary ectasy (*ectasie ampullaire*). Bauchard and Charcot also found the lesions known as miliary aneurisms (*aneurysmes miliaires*). These aneurisms, to which the hemorrhages are due, are most frequently located in the arteries of the corpus striatum. The question is, then, to ascertain why this artery should be the seat of predilection of these aneurisms. The explanations that have been given are generally erroneous; that of Nothnagel among the rest, that the artery of the striated body, being a direct branch of the carotid, is, for this reason, subject to great increase of tension.

“The anatomical reason for the fact is very different. While the arteries that supply the nutrition of the medullary substance of the brain are the *terminal branches*, those of the cortical substance *are not*, and form a very rich anastomosing network which terminates extensively in the pia mater. This anatomical arrangement causes hæmo-dynamic differences, very marked in the two arterial systems when the pressure of the blood is increased.

“To demonstrate this fact experimentally, M. Mendel had a rubber ball made (heart), communicating with a system of tubes (arteries), the arrangement of which corresponded as nearly as possible with the physiological circulating system. On pressing the central ball, and consequently increasing the

tension in the system of tubes, it was found that the pressure in the terminal tubes (artery of the corpus striatum) was almost equal to that of the principal tube (carotid), while the pressure in the anastomosing tubes (cortical arteries) was only half as great as that of the principal tube. Supposing the other conditions to be equal, this experiment proves that in man, in case of the increase of tension of the blood, the increase of pressure, and consequently the rupture, would be more likely to occur in the artery of the medulla than in that of the cortical substance.

“ In regard to the arteries that are distributed to the posterior parts of the brain, and which are derived from the vertebræ, their tortuous course and the existence of the posterior communicating, form a mechanical arrangement intended to prevent the consequences of sudden elevation of arterial tension.

“ The existence of the miliary aneurisms in the arteries is explained by the fact pointed out by H. Weber, that under the influence of the tension of the blood the artery becomes elongated at the same time that it is distended. The increased tension in the terminal arteries induces in time an atrophy of the muscular layer and the formation of ampulary ectasis.

“ It must not be forgotten that in a certain number of cases the hemorrhage is produced indirectly by stasis in the veins.

“ This fact is easily understood when it is remembered that the blood in the arteries of the corpus striatum flows in a course which is very much restricted, while the arteries of the cortical substance may empty into the venous sinuses.

“ The principal phenomena that follow the ictus are the loss of consciousness, vomiting, and convulsions. Some attribute these symptoms to compression of the brain, others to cerebral hyperæmia, and others, again, to anæmia. It is certain, however, that the quantity of blood contained in the brain does not undergo any change except in a degree depending on the variations of the quantity of liquid in the cerebro-spinal system. But that does not prevent a partial anæmia of the brain from coexisting with hyperæmia, limited to a part of the hemisphere.

“ In order to study the hemo-dynamic conditions in cases of effusion, Mendel removed from his artificial system some

drops of water, while at the same time he increased the tension within the tubes. All the indications manifested considerable oscillations in the pressure, and, as a final result, there was notable diminution of the tension in the part which represented the cortical arteries.

“ Perhaps the symptoms of the apoplectic stroke might be attributed to the sudden changes in the pressure in the arteries of the interior of the brain, modifications which result in anæmia of the cortex and hyperæmia of the medullary substance.

“ On this account the application of ice to the head in case of cerebral hemorrhage would only increase the anæmia of the cortex and the hyperæmia of the medullary substance. The proper treatment consists in allowing absolute rest, the head a little elevated.

“ Virchow has pointed out to Mendel that at first arterial fluctuations are never determined in the apoplectic regions, a circumstance that should take place if these arteries had been subjected to increased pressure.

“ Besides, this theory would not explain, he said, why the lesion is always unilateral when the increase of pressure is felt equally on both sides.”

ANTI-KAMNIA AS AN ANTIPYRETIC.—Dr. Caleb Lyon, of Rossville, Staten Island, in a letter addressed to the Anti-kamnia Chemical Company, states that after nearly twenty-five years of hospital and private practice, he would rather abandon morphine than antikamnia, which he also considers an unequalled febrifuge. Indeed, its antipyretic qualities are wonderful in reducing the temperature. He has never had a patient object to taking the dry powder on the tongue, nor had one complain of feeling the slightest malaise after its administration.

CEMENT FOR GLASS is obtained, according to Professor H. Schwarz, by dissolving one part of bichromate of potassium for every five parts of gelatine or glue, in a solution containing from one to ten per cent of the latter. After having been applied to the glass, the cement, on exposure to the sunlight, loses its property of swelling and dissolving in water, in consequence of the partial reduction of chromic acid.—*Phar. Cont. Halle.*

THE PROGRESS OF INFECTIOUS DISEASES AND DEATH RATES AT THE MOST RECENT DATES.

COMPILED BY HARRY KENT BELL, M.D.

ALABAMA.—*Mobile*, 31,076 : Reports 82 deaths during June, of which 38 were under five years of age. Annual death-rate, 31.5 per 1000. From zymotic diseases, 23, and from consumption, 13.

For the year 1890 there were 847 deaths, of which 471 were of colored inhabitants. There were 272 deaths of children under five years of age. From zymotic diseases there were 157 deaths, and from consumption, 136. The death-rate per 1000 was 21.17—the lowest for fifteen years, with the exception of 1880, when the rate was 19.05.

CALIFORNIA.—Reports from seventy-five cities, towns, and localities, having a population of 675,954, during June, show 995 deaths to have occurred from all causes. Annual death-rate, 17.64. Deaths from consumption, 140 ; pneumonia, 59 ; bronchitis, 29, and congestion of the lungs, 13. Croup and diphtheria caused 54 deaths ; typhoid-fever, 23.

San Francisco, 297,990 : Deaths during the month of June, 495. From consumption, 62 ; acute lung diseases, 70 ; croup and diphtheria, 28 ; typhoid-fever, 8. Death-rate, 19.6.

Los Angeles, 53,394 : Deaths, 68. From consumption, 13 ; acute lung diseases, 5. Death-rate, 15.3.

Oakland, 50,000 : Deaths, 52. From consumption, 6 ; acute lung diseases, 3. Death-rate, 12.4.

CONNECTICUT.—The mortality report for June comprises 163 towns. There were 977 deaths reported in the State during the month. This was 194 less than in May ; it was 69 more than in June, 1890, and 120 more than the average number of deaths in June for the five years preceding the present.

In the first half of this year the number of deaths was 336 less than in the first half of 1890, or 493 more than the average of the first half of the five years preceding.

The death-rate was 17.3 for the large towns ; for the small towns, 12.8, and 15.8 for the whole State.

The deaths from zymotic diseases were 199, being 20.4 per cent of the total mortality against 15.7 per cent in May.

New Haven, 86,045 : Deaths, 139—under five, 46 ; from zymotic diseases, 28. Death-rate, 17.1.

Hartford, 53,230 : Deaths, 105—under five, 37 ; from zymotic diseases, 27. Death-rate, 20.5.

Bridgeport, 48,866 : Deaths, 102—under five, 48 ; from zymotic diseases, 29. Death-rate, 23.8.

DISTRICT OF COLUMBIA, 250,000 : Reports for four weeks ending June 27th, 497 deaths, of which number 222 were under five years of age. Annual death-rate per 1000, 25.82.

From zymotic diseases there were 154 deaths, and from consumption, 47.

The Annual Report of the Health Officer for the year ending June 30th, 1890, shows that there were 5564 deaths, of which 2630 were of colored inhabitants.

This is an increase of 412 over the previous year.

The deaths from zymotic diseases numbered 1348 ; from constitutional diseases, 1163 ; from local diseases, 2341 ; from developmental diseases, 496 ; by violence, 216. The death-rate for the year was 22.25.

ILLINOIS.—*Chicago*, 1,200,000 : Deaths during the month of June, 1797—787 under five years of age. Death-rate, 14.97. From zymotic diseases, 457 ; consumption, 149.

IOWA.—*Davenport*, month of May, 1891. Total deaths, 31, including diphtheria, 1 ; enteric-fever, 1 ; influenza, 2 ; and phthisis pulmonalis, 3.

Month of June, 1891. Total deaths, 34, including diphtheria, 3 ; enteric-fever, 2 ; measles, 1 ; influenza, 1 ; and phthisis pulmonalis, 4.

LOUISIANA.—*New Orleans*, 254,000 : Reports for four weeks ending June 27th, 618 deaths, of which 214 were colored, and 263 were under five years of age. Annual death-rate, 31.73 per 1000.

There were 129 deaths from zymotic diseases and 50 from consumption.

MARYLAND.—*Baltimore*, 455,427 : Deaths during June, 725, as against 1094 for the corresponding month of June, 1890. Of these, 578 were white and 147 colored ; a death-rate of 18.07 per 1000 for the former and 24.84 per 1000 for the latter. The death-rate for the whole population was 19.12 per 1000. 48 persons died from infectious diseases, 60 from consumption, and 45 from pneumonia. 319, or 44 per cent of the total deaths, were in children under five years of age.

During the month 167 cases of infectious diseases were reported, a decrease of 6 over the preceding month.

MASSACHUSETTS.—Part II. of Report of Water-Supply and Sewerage by the State Board of Health is the companion volume of that noticed in our June number last. It is a volume of 910 pages, with numerous maps, diagrams, plates, and tabulated statistics, comprising elaborate descriptions and experimental tests of various filtration systems of sewage and water, purification of sewage by chemical precipitation, investigations upon nitrification and the nitrifying organism, and report of the biological work of the Lawrence Experiment Station—a report of rare merit and of great utility to all health authorities and others interested in the protection of the public health.

Boston, 448,477 : During June, 1891, deaths reported, 736, of which number 228 were under five years of age. Annual death-rate per 1000, 19.23. From zymotic diseases, 85, and from consumption, 119. Cases of contagious diseases reported, 438.

MICHIGAN.—At the quarterly meeting of the State Board of Health, July 14th, 1891, action was taken directing the Secretary to publish a brief pamphlet telling how to restrict and prevent consumption, the pamphlet having been adopted by the Board after very careful consideration. This pamphlet states that “consumption is the most common and fatal disease ;” that “the number of deaths which actually occur in Michigan from consumption is probably over twenty-five hundred yearly ;” that “consumption is now known to be a communicable disease ;” and that “a large part of this mortality can and ought to be prevented.” The pamphlet describes the bacillus which causes consumption and which is in the sputa

of consumptives, cites instances where consumption has been communicated by the sputum dust containing these germs, and emphasizes the importance of destroying the sputa of consumptives.

The pamphlets on the restriction and prevention of the other most dangerous communicable diseases, diphtheria and scarlet-fever, were ordered reprinted for distribution among the neighbors of those sick with these diseases throughout the State.

A proposed pamphlet on the "Restriction and Prevention of Measles" was discussed and amended, and the Secretary was directed to print and distribute it as amended, for instruction, and as an aid in the restriction and prevention of this disease, which the Board declares is a disease "dangerous to the public health," that causes many more deaths in Michigan than small-pox does, and which should be dealt with according to the laws in Michigan.

The age at which most deaths occur from measles is that between one and two years. This is the age of greatest danger, and all should take especial care to guard children at that age.

Epidemic Influenza and Pneumonia in Relation to Cold, Winds, and Atmospheric Ozone, in Michigan, was the subject of a special report by Dr. Baker, as the Committee on Climate and Health. He presented the results of an investigation by a fellow of the Royal Meteorological Society, showing that in England the great epidemic which culminated, in the week ending January 17th, in more than double the ordinary deaths from diseases of the respiratory organs, came during what the English scientist calls "the great frost of 1890-91," concerning which he says, "So far as the southern portion of England is concerned, there does not seem during the last century to have been any such prolonged period of frost as that of 1890-91." That is, the meteorological conditions have been as exceptional as have the sickness and deaths from respiratory diseases. Dr. Baker thinks there is no doubt that we now have the facts proving what are the controlling factors in the causation of these diseases.

For the month of June, 1891, compared with the preceding month, the reports indicate that cholera infantum, cholera morbus, dysentery, typho-malarial-fever, puerperal-fever,

remittent-fever, typhoid-fever (enteric), and diphtheria increased, and that inflammation of brain, membranous croup, pneumonia, scarlet-fever, influenza, and measles decreased in prevalence.

Compared with the preceding month the velocity of the wind was less, the prevailing direction was the same, the rainfall was greater, the temperature was much higher, the absolute humidity and the relative humidity were considerably more, the day ozone and the night ozone were less.

Compared with the average for the month of June in the five years 1886-90, influenza and dysentery were more prevalent, and typho-malarial-fever, inflammation of brain, whooping-cough, scarlet-fever, and diphtheria were less prevalent in June, 1891.

For the month of June, 1891, compared with the average of corresponding months in the five years 1886-90, the velocity of the wind was about the same, the prevailing direction was northeast (instead of southwest), the rainfall was greater, the temperature was slightly higher, the absolute humidity and the relative humidity were about the same, the day ozone and the night ozone were less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of June, 1891, at fifty-five places; scarlet-fever at sixty-five places; typhoid-fever at twenty-five places, and measles at seventy-eight places.

Reports from all sources show diphtheria reported at nine places more; scarlet-fever at one place more; typhoid-fever at eight places more, and measles at eleven places less in the month of June, 1891, than in the preceding month.

Detroit, 220,000: During June, deaths, 315—under five years of age, 88. Death-rate, 17.36. From zymotic diseases, 72; from consumption, 28, and from pneumonia, 22.

MINNESOTA.—*Public Health* bulletin for April reports:

State: Total deaths in May (reported up to June 20th), 732, about the average of the month for the last four years.

Measles, 15 deaths (7 males, 8 females), eight localities in six counties, same as last month, and one half the average, for the same month for the last four years.

Scarlatina, 10 deaths (3 males, 7 females) in six localities and six counties, about the same as last month, and less than one half the average of May for the last four years.

Diphtheria, 31 deaths (15 males, 16 females) in eleven localities and eleven counties ; 25 per cent less than the May average since 1887.

Croup, 5 deaths (1 male, 4 females) in four localities and as many counties, and but one-half of the average of this month for four years.

Enteric-fever, 10 deaths (2 males, 8 females) in four localities and four counties ; less than last month, and not 75 per cent of the May average since 1887.

Bronchitis caused 14 deaths.

Pneumonia caused 57 deaths.

St. Paul, 150,000 : Deaths during June, 152—86 under five years of age. Deaths from zymotic diseases, 29 ; from consumption, 16. Death-rate, 12.13.

MISSOURI.—*St. Louis*, 460,000 : Deaths during June, 840—under five years, 432. Death-rate, 21.9. From zymotic diseases, 241, and from consumption, 70.

Kansas City, 132,416 : Deaths during June, 110—45 under five years of age. From zymotic diseases there were 20 deaths, and from consumption, 10.

NEW JERSEY.—*Hudson County*, 283,850 : Deaths during June, 661—under five years, 312. From zymotic diseases, 188 ; from consumption, 71. Death-rate, 27.9.

Paterson, 78,358 : Deaths during June, 148—54 under five years of age. Death-rate, 18.2. Deaths from zymotic diseases, 31 ; from consumption, 20.

NEW HAMPSHIRE.—*Manchester*, month of June, 1891. Population, 45,200. Total deaths, 61, including enteric-fever, 1 ; whooping-cough, 1 ; and phthisis pulmonalis, 8.

NEW YORK.—The Secretary of the State Board reports that the monthly reports from 138 cities, villages, and towns, aggregating a population of 4,305,000, show a total mortality of 7893 deaths during the month of June, making a death-rate of 22.78 per 1000 per annum. The entire reported mortality for the State is 9321, or 310 deaths daily ; in May there were

tion of the city, attained by the constant and systematic inspections made under the direction of this department, the careful and conscientious work of the Summer Corps of physicians, and to the charitable efforts of the several societies and newspapers (among the best known of which are St. John's Guild, the King's Daughters, the Hebrew Sanitarium, the *Tribune* Fresh Air Fund, and the Summer Corps of the *Evening World*) in raising funds and providing rest and recreation for the children of the poor.

Infectious and contagious diseases were all less prevalent than in 1889, with the exception of measles, the deaths from which numbered 730 against 470 in 1889. Scarlet-fever and diphtheria, the two most dreaded diseases of this class, caused, respectively, 408 and 1262 deaths, against 1242 and 1686 in 1889, and an average for the past ten years of 1012 and 1608.

Diarrhæal Diseases.—These diseases caused 3346 deaths during the year, against 3648 in 1889, and an actual annual average of 3716 for the previous ten years.

June, 1891, 1,680,796: Total deaths, 3652—1718 under five years. Death-rate, 26.42. Zymotic diseases per 1000 deaths from all causes, 236. Deaths from consumption, 344.

Brooklyn, 862,155: Total deaths, 1771—898 under five years. Death-rate, 24.99. Zymotic diseases per 1000 deaths from all causes, 255.37. Deaths from consumption, 160.

Albany, 100,000: Total deaths, 174—48 under five years. Death-rate, 20.88. Zymotic diseases per 1000 deaths from all causes, 151.51. Deaths from consumption, 30.

Syracuse, 88,000: Total deaths, 100—17 under five years. Death-rate, 13.45. Deaths from zymotic diseases per 1000 deaths from all causes, 120.00. Deaths from consumption, 17.

Buffalo, 255,000: Total deaths, 443—166 under five years of age. Death-rate, 20.61. Deaths from zymotic diseases per 1000 deaths from all causes, 90.30. Deaths from consumption, 58.

Rochester, 138,327: Total deaths, 185—54 under five years of age. Death-rate, 16.00. Deaths from zymotic diseases per 1000 deaths from all causes, 108.10. Deaths from consumption, 19.

NORTH CAROLINA.—*The Bulletin of the State Board of*

Health reports the following : In thirteen towns, with 43,214 white and 37,712 colored inhabitants, there were 58 deaths among the whites and 57 among the colored ; the respective annual death-rates were 16.1 and 18.1. Deaths under five years of age numbered 42.

There were 14 deaths from diarrhoeal diseases ; 21 from consumption ; 5 from pneumonia ; and 10 still-born.

Wilmington, 21,000 : Total deaths, 35—11 under five years of age. Annual death-rate, 20.00 per 1000.

Raleigh, 15,000 : Total deaths, 28—11 under five years of age. Annual death-rate, 22.4 per 1000.

OHIO.—*The Monthly Sanitary Record* reports that in eighty-four cities and towns, with an aggregate population of 1,240,890, there were, during the month of May, 1773 deaths, of which number 341 were under five years of age. Deaths from zymotic diseases numbered 292, and from consumption, 228.

Cincinnati, 296,908 : Deaths, 534—under five years, 131 ; from zymotic diseases, 87. From consumption, 59. Death-rate, 21.58.

For the year 1890 the total number of deaths occurring within the city limits was 6441, being 19.81 per 1000 of an estimated population of 325,000.

This is an increase of 519 over the mortality in 1889, and is attributable principally to the following causes :

Diphtheria, 414—increase, 45 ; typhoid-fever, 205—increase, 62 ; pneumonia, 608—increase, 121 ; whooping-cough, 50—increase, 26 ; accidental deaths, 241—increase, 37 ; homicide, 19—increase, 5 ; suicide, 53—increase, 13 ; sunstroke, 52—increase, 51.

The number of deaths resulting from accident and suicide respectively exceeds that of any former year since 1867.

From consumption there were 756 deaths, or 11.73 per cent of the total mortality.

The number of births reported to this department during 1890 was 8036, an annual rate of 24.72 per 1000 of population, or one birth in every 40.44 persons.

Cleveland, 261,353 : Deaths, 412—under five years, 53 ; from zymotic diseases, 72. From consumption, 60. Death-rate, 18.91.

Columbus, 88,000 : Deaths, 112—17 under five years ; from zymotic diseases, 15. From consumption, 21. Death-rate, 15.46.

PENNSYLVANIA.—*Philadelphia*, 1,069,264 : In the two weeks ending June 27th, there were 873 deaths, of which 414 were under five years of age. Annual death-rate per 1000, 21.2. From zymotic diseases there were 215 deaths, and from consumption, 83.

Pittsburg, 247,000 : Reports for four weeks ending June 27th, 457 deaths, of which number 251 were under five years of age. Annual death-rate, 24.02 per 1000. From zymotic diseases there were 70 deaths, and from consumption, 21.

Williamsport, month of June, 1891. Population, 27,109. Total deaths, 15, including none from contagious diseases.

TENNESSEE.—The principal diseases, named in the order of their greater prevalence in the State for the month of June, were : Non-contagious diseases—malarial-fevers, dysentery, diarrhœa, cholera morbus, cholera infantum, consumption, and pneumonia. The contagious and infectious diseases reported are : Typhoid-fever in Anderson, Cocke, Davidson, Hamilton, Henry, Robertson, and Rutherford ; whooping-cough in Anderson, Davidson, Franklin, Gibson, Hancock, Rutherford, and Shelby ; measles in Bradley, Davidson, Gibson, Henry, and Knox ; scarlet-fever in Franklin and Shelby ; influenza in Decatur and Montgomery ; meningitis in Anderson and Overton ; diphtheria in Shelby ; croup in Davidson ; mumps in Williamson ; small-pox in Knox (one case).

Chattanooga, 30,000 : Total deaths, 73—46 colored. Annual death-rates, 16.20 white, 45.20 colored per 1000.

Knoxville, 43,706 : Total deaths, 80—32 colored. Annual death-rates, 16.56 white, 42.84 colored per 1000.


Memphis, 60,000 : Total deaths, 126—69 colored. Annual death-rates, 20.72 white, 30.66 colored per 1000.

Nashville, 76,309 : Total deaths, 167—84 colored. Annual death-rates, 20.97 white, 34.95 colored per 1000.

WISCONSIN.—*Milwaukee*, 230,000 : Deaths reported during June, 348—103 under five years of age. Death-rate, 18.16. Prevailing causes of death : Pneumonia, 42 ; convulsions, 28 ; bronchitis, 16 ; diphtheria and croup, 22 ; consumption, 30.

EDITOR'S TABLE.

Removal.—A. N. Bell, M.D., the Editor hereof, has changed his residence from 113a Second Place to 291 Union Street, Brooklyn.

 ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, Brooklyn, N. Y.

DR. WALTER WYMAN, the successor of Dr. John B. Hamilton, resigned, as Supervising Surgeon-general of the United States Marine Hospital Service, entered the service in 1876, and soon thereafter became identified with the foremost workers of the medical corps. For several years past he has been the chief assistant of his predecessor, and has thereby become thoroughly familiar with the duties of the office and the details of the service. Moreover, he has from the outset maintained an active membership and co-operation in the work of such organizations as comprise the study and promotion of preventive medicine generally. He has been an active member of the American Public Health Association since 1884; was secretary of the Section of Public and International Hygiene in the International Medical Congress at Washington in 1887, and is identified with the Section on State Medicine in the American Medical Association.

He is the author of a number of published papers on matters relating to public health, the most recent being a contribution to "Rohe's Text-Book of Hygiene" on Quarantine. Among other reports and papers from his pen of special excellence are the following: "Hospital Records, with Description of a New System;" "Hospital Management;" "River Exposure and its Effect upon the Lungs;" "Hygiene of Steamboats on Western Rivers;" "Hardships of the Chesapeake Bay Oystermen;" "System of Sewerage Disposal in Berlin;" "Treatment of Cholera by Paris Physicians in 1884;" "Government Aids to Public Health."

In 1885 he visited the principal hospitals and laboratories of Europe and pursued studies in Vienna. On his return he was assigned to the command of the service at New York,

remaining three and a half years, when he was ordered to Washington as medical purveyor and chief of the quarantine division.

In the fall and winter of 1890 he made an inspection of the quarantine stations of the Atlantic and Gulf coasts from the Delaware Breakwater to New Orleans, and visited Havana to familiarize himself with the local conditions of this perennial menace to the health of the United States.

WOOL *versus* LINEN is the subject of a long editorial in the *Irish Textile Journal* of July 15th, 1891, taking exception to the article "Woolen or Linen," by Mr. R. C. Rutherford, in the May number of THE SANITARIAN, which attempts to show that, because Sir Erasmus Wilson deems linen to be the best dressing for *diseases of the skin*, linen is, therefore, the most healthful fabric for clothing! Surely the editor might have added, for the same reason: and that inasmuch as arsenic, iodide of mercury, and corrosive sublimate are well known to be excellent remedies to be taken internally in the treatment of some of the worst forms of skin diseases, the habitual use of these remedies by healthy people would be an effectual means of preventing such diseases. And he would have the reader believe that none of the authorities cited by Mr. Rutherford in favor of woolen clothing "indicate that they have given linen a trial at all;" that linen is indeed a substance they know nothing at all about, and consequently their opinions are of no value. And he winds up by saying, "We should wish to see [what we should be delighted to see] fair trials by competent and impartial men of more than one method of clothing." Alas! alas! where dwellest thou—under a hackle?

SCHOOL SANITATION.—Dr. Storrs, President of the Connecticut Medical Society, has been lecturing on the subject of health in the public schools, insisting that the lives of hundreds of children are sacrificed annually to the unhealthful condition of the buildings used. Dr. Storrs claims that the school buildings of Hartford, Conn., are the equal of those of any city in the Union, yet even in Hartford he found "one large and central district school-house, so perfect a fire trap and so foul in its sanitary condition that words fail me in

speaking of this building," and this case is said to be by no means exceptional.

Dr. Storrs lays emphasis on the importance of good ventilation, which he illustrates as follows :

" We estimate that a school-room of fifty pupils would throw off in the form of cutaneous and pulmonary exhalation, in one month of five hours each day, 750 pounds, which contains much putrescible matter, and in rooms deficient in ventilation is precipitated and gives in its decay the peculiar odor of the badly ventilated rooms. These respiratory impurities furnish the best possible conditions for the growth and dissemination of microbes.

" Children from homes infected with germ diseases, consumption, scarlet-fever, diphtheria, will poison the air of a room unless the floating germs are carried off by fresh currents of air. The air space allowed for each child in the schools in Hartford is 225 cubic feet, with the air to be changed three times per hour. This is about one third of the amount needed."

And he adopts the suggestion of Dr. Seibert, of New York, that a thorough examination should be made by physicians for the purpose of determining the sanitary condition of the school buildings and children.

He also favors the proposition recently proposed in the British Parliament by the Earl of Meath, requiring the teaching of physical exercises to the scholars in the public schools—that is, that the teachers should not only interest themselves in the mental, but in the physical condition of children, teaching them dumb-bell and Indian club exercises, marching, etc. In Germany, France, Sweden, Norway and Switzerland physical instruction is compulsory in all schools. In Sweden, a school drill is practised which aims at the scientific and systematic developments of all parts of the body, and the teacher is required to have a thorough knowledge of anatomy ; while in Prussia and Saxony a teacher must know the theoretical side of gymnastics, as well as have sufficient practical knowledge to instruct pupils. It is sincerely to be hoped that the suggestions of Dr. Storrs, based as they are upon the practical benefits of the most enlightened nations abroad, will lead to their adoption in this country.

LITERARY NOTICES AND NOTES.

FIFTH ANNUAL REPORT OF THE FACTORY INSPECTORS OF THE STATE OF NEW YORK, ALBANY.

While it may be truthfully said that thorough exposure of an evil in most cases half abates it, it may be said with equal truthfulness, *corporations excepted*. Nothing that we know of better shows this than the volume now before us, and those from the same source that have preceded it. It is axiomatic that corporations have no souls; they are unquestionably alike devoid of sensibilities. No amount of exposure of the evils of which they are capable and wont to practise will have a feather's weight of influence, unless it is supported by law energetically administered. Hence it is that, year by year, since the organization of the factory inspection service, it has been necessary to amend the laws to meet the cunning devices of those who avail themselves of every possible means to evade them. The resentment on the part of many employers to State supervision of their establishments, we are told, has almost totally disappeared. This is a good sign, but attention is invited to the tabulated statement of inspections, where it is observed that many of the "changes ordered" are not marked "complied," which plainly shows the necessity of persistent vigilance and exacting promptitude.

The value of women inspectors has not, it is said, been sufficiently tested (scarcely five months since their employment) to warrant an expression of opinion with regard to their special utility. It is noted, however, that while they are fully as apt as the male deputies in such matters as relate to the employment of children, their ages and hours of labor, etc., yet there is a diffidence, possibly no more than natural, about requiring the guarding of machinery, and, of course, an inability to explain how it should be guarded in those places where necessity for safeguards is apparent. This suggests to the reviewer that there are numerous crowded and stifling places of employment, not technically known as factories, in New York and Brooklyn, where the chief kind of machinery used—that for sewing is not such as to excite diffidence, but

pity and disgust on the part of women or any other intelligent inspectors, if they would visit them. Many of these places are literally beneath the notice of inspectors generally—of health inspectors as well as factory inspectors—as they are of the public ; they are in deep cellars and under the pavements of the showy and thrifty stores along the most crowded streets. Others there are in the garrets, and not a few at the “home quarters” of the operatives, and in such out-of-the-way places as are deemed to be the least liable to discovery. Have the factory inspectors no authority over such places ?

A page is devoted to comment on the “sweat-shops,” and the need of more legal authority to define and require more air-space for the male tailors, who are better able to take care of themselves than the sewing women and milliners and other female employés of the stores and shops just above referred to, not noticed at all : all alike the subjects of harder task-masters than any of ante-bellum times, which served to excite the appeals and passions of leaders to deadly strife, who are now, as they have ever been, purblind to, if not, indeed, the beneficiaries of the vilest kind of slavery ever tolerated among people called Christians. In short, while a study of the statistical tables, of which the report chiefly consists, shows some progress in overcoming the slavery of unconscionable task-masters and lessening the liabilities to accident in factory life, it is chiefly valuable as a basis of suggestion for more and better work against other and greater evils yet to be overcome.

MEDICAL DIAGNOSIS : A CLINICAL TEXT-BOOK FOR PHYSICIANS AND STUDENTS. By DR. OSWALD VIERORDT, Professor of Medicine at the University of Heidelberg ; formerly Privat Docent at University of Leipzig ; Professor of Medicine and Director of the Medical Polyclinic at the University of Jena. Translated, with additions from the Second Enlarged German Edition, with the author's permission, by FRANCIS H. STUART, A.M., M.D., Member of the Medical Society of the County of Kings, N. Y. ; Fellow of the New York Academy of Medicine ; Member of the British Medical Association, etc. 8vo, pp. 716. Numerous colored and wood engravings. Price, cloth, \$4 ; sheep, \$5. Philadelphia : W. B. Saunders.

This is the most complete work of its kind hitherto published. A clinical work, *par excellence*, by a thorough master in his profession, comprising all that is of recognized value in the most recent advances of bacteriology in relation with disease, together with a description of the best means, instrumental and otherwise, of turning this knowledge to account. Moreover, both author and publisher are fortunate in having for translator one so thoroughly competent as Dr. Stuart to emphasize the value of the work by occasional additions particularly pertinent to the medical student, who would, as he may, by making himself familiar with the mode of study, as well as the substance of this treatise, acquire with the greatest facility that knowledge which is above all others the most essential to professional success—a correct diagnosis.

PRACTICAL INTESTINAL SURGERY. By FRED. B. ROBINSON, B.S., M.D., Professor of Anatomy and Clinical Surgery, Toledo Medical College, Toledo, Ohio. Vol. I., 12mo, pp. 172. Physician's Leisure Library Series, issued monthly, \$2.50 a year ; single copies, 25 cents. Detroit, Mich. : George S. Davis.

The special merit of this book is its almost entire devotion to the author's own extensive practice rather than to the broad field of gynecological surgery generally, by which it is abundantly sustained and verified by citations of the most recent pioneers in its purview—Senn, Treves, and Lichtenstein, of whose work it is the practical gist under clear comprehension.

VENTILATION AND IMPURE AIR AS PROPHYLACTIC OR CAUSATIVE OF DISEASE. By P. C. REMONDINO, M.D., San Diego, Cal. A brochure of twenty-five pages, reprinted from Volume XVI. of the Transactions of the American Public Health Association, comprising much information of practical utility to people generally, among whom it is worthy of the widest possible circulation ; but with a note, if possible, eliminating a typographical error on page 7 : " They [the people] should realize that carbonic *oxide* is not inimical to life, but only cannot support life ; that men have temporarily labored in an atmosphere with 17 or 18 per cent of that gas,

whereas ordinary air only has 4 per cent." (The italics are the editor's.) Acid should be substituted for oxide, and 10.000 for cent.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS. No 1, Volume II., July, 1891, contains : Hay-fever and Paroxysmal Sneezing, by Sir Morell Mackenzie, M.D. ; Tuberculosis of the Bones and Joints, by Dr. Fedor Krause ; A Study of Malignant Diseases of the Upper Air Tract, by F. H. Bosworth, M.D. Monthly : \$10 a year ; \$1 a number. New York : William Wood & Co.

THE MEDICAL REGISTER OF NEW YORK, NEW JERSEY, AND CONNECTICUT, FOR THE YEAR COMMENCING JUNE 1ST, 1891, PUBLISHED UNDER THE SUPERVISION OF THE NEW YORK MEDICO-HISTORICAL SOCIETY, WILLIAM T. WHITE, M.D., Editor. New York : G. P. Putnam's Sons. Replete with information of interest, and with regard to the physicians, dentists, pharmacists, and nurses ; hospitals, asylums, dispensaries, educational and other institutions ; and societies and associations in which physicians and their congeners are more or less concerned in the several States named ; together with a digest of recent laws which have for their object the regulation of the practice of medicine, and the protection of the public from quackery. The editor deserves great credit for comprising so much useful information in so little space—a 12mo volume of 452 pages, containing the names and addresses of 7854 physicians, besides long lists of the other persons comprised therein. The publisher's work is also admirably done, befitting the usage of a book of so much usefulness.

VACATION TIME is the title of a little book by H. S. DRAYTON, M.D., so well known as a writer on popular hygiene, just issued from the press of Fowler & Wells Co., New York. As an epitome of summer hygiene the book is so good and practical that they who would read it and follow its suggestions could not but get real profit out of their summering, wherever they might be. It is sent by mail on receipt of price, 25 cents. Address the publishers.

SOCIALISM. By JOHN STUART MILL. Being a Collection of His Writings on Socialism, with Chapters on Democracy, the Right of Property in Land, and the Enfranchisement of Women. No. 2 of the Social Science Library. The Humboldt Publishing Co., 19 Astor Place, New York.

The publication of a special volume showing John Stuart Mill's attitude upon the question of Socialism should be matter of congratulation, both to Individualists and Socialists. As a man of action he took part in all the progressive movements of the time ; battled bravely for women suffrage ; insisted strenuously on the right of the poorest to a voice in the councils of the nation, since their very existence was jeopardized by misgovernment ; and anticipated the whole Irish and general agrarian movement by the keenness of his criticism on the sins of landlords. All these subjects are treated with a peculiar lucidity that John Stuart Mill had invariably at command, in this second volume of the Social Science Library. They make 214 pages of excellent reading matter, and at the modest price of 25 cents should be read by many.

FUNK & WAGNALL'S STANDARD DICTIONARY OF THE ENGLISH LANGUAGE, judged by advance sheets before us, bids fair to be all that it promises—a standard in fact as well as in name for all English-speaking people. Among the eminent scholars enumerated who are engaged in the different departments of editorial work upon it are Professor Shaler, of Harvard ; Professor Theodore N. Gill ; Professor Simon Newcomb ; Professor R. Ogden Doremus ; ex-Minister E. J. Phelps, of Yale ; Hon. T. M. Cooley, Chairman of the United States Interstate Commerce Commission ; William R. Harper, President of the University of Chicago ; Professor Francis E. March, of Lafayette College ; Professor Max Müller, and Professor Huxley. Scholars such as these in responsible editorship of the different departments must remove every doubt of the substantial accuracy and thoroughness of the work, and commend it to all who would know what English words signify as interpreted and employed by those who make the best use of them.

THE REPRESENTATION OF THE MEAN YEARLY TEMPERATURE OF A PLACE AS A FUNCTION OF ITS GEOGRAPHICAL

LONGITUDE AND LATITUDE. Inaugural Dissertation for the Degree of Ph.D., at the University of Zürich, August 9th, 1856. By WILHELM SCHOCH. Translated with an Introduction by Frank Waldo. The Register Publishing Co., Ann Arbor, Mich., 1891.

The translator's reason for issuing this pamphlet is that, although the data here given were available by the author (W. Schoch) thirty years ago, they have been but little used, and scarcely improved upon since ; and his purpose is that the meteorologists of this country may have an opportunity to study the methods employed, and perhaps some one may be induced to take it up and solve the problem anew, using the new data which have accumulated since Schoch's paper was published—a worthy object, surely, which should not fail of the attention it deserves. But, as the translator remarks, before taking up this question, unless the reader has studied more mathematics than is usually given in the college course, he must needs devote some time to preparation by getting a clear idea of the nature of spherical functions and their application.

THE VALUE OF ANY STATISTICAL PRESENTATION must depend upon the basis upon which it is made, the integrity of the collection of the various elements of it, and the analysis which accompanies it. No one has any right to quote statistical tables without using and understanding the analysis of them. It is because of the flippant and careless use of statistics by writers and speakers that it receives their condemnation. No one thinks, however, of condemning anæsthetics because the burglar chloroforms his victim ; or the elementary rules of arithmetic, the means by which all honest accounts are kept, simply because dishonest accounts are made possible by the same means.—*From the Value of Statistics, by Hon. Carroll D. Wright, in the Popular Science Monthly for August.*

INFLUENZA, by SIR MORELL MACKENZIE, M.D., is one of the many excellent papers in *Littell's Living Age* for August 1st. Besides this, the numbers for August 1st and 8th contain : Prince Napoleon ; Bulgars and Serbs ; The Locust Plague in Algeria, and Italy and France ; The Gurkhas : a Fighting Race ; Richard de la Pole ; " White Rose ;" A Night

in a Hay-Stack, and Ways and Whims of Fresh Water Fishes ; John Bright's School ; Monckton Milnes ; The King's Luck ; A Publisher and his Friends ; L. E. L. ; Essays in the Obvious ; instalments of " A Philanthropist ;" " The Woman in the Morgue ;" " A Little Love Affair," and several nuggets of poetry.

For fifty-two numbers of sixty-four large pages each (or more than 3300 pages a year) the subscription price (\$8) is low ; while for \$10.50 the publishers offer to send any one of the American \$4 monthlies or weeklies with *The Living Age* for a year, both postpaid. Littell & Co., Boston, are the publishers.

THE WORK OF A SINGLE DAY, as shown by " The Press as a News Gatherer," in the August *Century*, is more clearly demonstrated by the extent of the work performed daily by the Associated Press than any other form of description. The New York office handles daily from 75,000 to 100,000 words, equal to from 50 to 70 columns of matter. On January 13th, 1891 (a date taken at random), this news amounted to 95,000 words. Of course, of this mass of material no paper prints the whole ; but most of it finds a place somewhere. To meet the requirements of the service, the Associated Press adapted the type-writer to receiving directly from the Morse instrument, and a special paper was made which facilitates the handling of reports. These details may seem of small moment, but they go to show the pains taken to insure perfect work. The agents of the Associated Press, who are selected for character and ability, are instructed to get all of the news, but if need be to sacrifice the " story" to the facts—in a word, to tell the truth. They are required to treat all political and religious events with judicial fairness, and to omit social happenings having an immoral tendency. We do not find that anything is lost to thorough journalism by such limitation, but, on the contrary, much influence is gained thereby. The Associated Press enjoys the public confidence in its reliability to a degree unapproached by any other organization, and this enhances the value of the franchises of the papers supplied by it. This confidence is based upon an experience of forty years.

INTERNATIONAL COPYRIGHT.—*The Home Journal* of July 29th contains a four-column article which expounds and explains this all-important question in a most clear and lucid way. It shows exactly how the new law affects authors, publishers, printers, and readers on both sides of the Atlantic, and it deals with every phase of the subject. The document makes very interesting reading withal. It is from the pen of that scholarly and brilliant essayist, ex-Mayor A. Oakey Hall, who has practised law on both sides of the Atlantic, and who understands the subject fully. New York: Morris Phillips & Co.

Harper's Weekly, of August 5th, remarks upon the same subject that the *London Times* says that it is a subtle question whether the effort to command the vast new public which is opened to him will not modify the aims and the style of the British author. May not the desire to please a large and uncultivated public somewhat degrade the character of British literature? For, says the *Times*, "it is an humbling thought that the widest circulation that any American author has attained during recent years was reached by a certain Rev. E. P. Roe, who lately died. Now, Mr. Roe, with all his virtues, was not a man whom clever writers should set themselves to imitate."

The *Times*, however, might reflect that although the largest circulation attained by journals in London is that of those of which little is known, the fact does not affect the quality of the *Times* or the *Spectator*. Moreover, the writers who set themselves to imitate others do not found a literature, nor is their imitation due to the desire to find an audience. It is the instinctive tribute to a power which fascinates and commands. The imitators of Byron merely expressed in that way, but unconsciously, the force of his fascination. It was not a device of authors to sell their wares.

The *Times*, however, says truly, "The best work of which a man is capable—this is what is most likely to bring him success." For the production of such best work fair play is a cardinal condition, and that is largely provided by the new law, which embraces artists no less than authors. Even if nobody should be pecuniarily benefited by it, everybody will feel better.

THE PROBLEM OF HEREDITY or inheritance is not only one of the most complex, but one of the most interesting topics connected with human life. The "why" of heredity may be readily recognized, but the "how" and the "what" is a very different matter. A good deal of light is thrown upon this difficult subject by Dr. Andrew Wilson, F.R.S.E., in a clearly written paper in the August number of *Harper's Magazine*. Inheritance, he says, is a matter of the continuity of the germ-plasm or germ-cells, which are handed down from one generation to another in cumulative ratio, carrying with them in each case not the features and qualities of the one predecessor and parent, but of all preceding generations. Assuming that the germ-plasm is liable to exhibit variations, we can see how and why such variations can be transmitted to new generations; but we have also to take into account the influence on the germ-cells of the body to which they belong. While, then, inheritance preserves through the continuity of the germ-cells the stability of the race, it gives the rein to variation, and by the combined influences of environment acting on the body of the individual, peoples the world with new and ever-varying forms of life.

HOW WILL VACATIONS AFFECT EDUCATION? asks Edward Hungerford, in the August *Century*, who proceeds to say that he does not know that an effect of summer migration on the country school is often observable. Exceptional instances exist, however, and cases may be numerous. The increasing disposition of families to prolong their stay in the country beyond the limits of the city-school vacation suggests that the time may not be far distant when those who control the village schools will adjust the terms and studies so as to enable children from the city to continue work during a portion of their stay. The similarity of courses in all graded schools favors this transfer, and by painstaking a fair adjustment might be reached. This would take away from many city families a chief objection to prolonging their sojourn, and would result in a positive benefit to the inhabitants. Lacking some such arrangement, the migratory habit must soon lead to the establishment of private schools in some districts to accommodate temporary residents.

PREVENTING COAL DUST EXPLOSIONS.—A German contemporary describes a method devised by Mr. Meissner for the prevention of mine explosions due to coal dust. The method consists in moistening the coal itself before being hewn, instead of sprinkling water in the galleries. Experiments were first made in the Sarrebruck mines, and particularly in No. 3 and No. 5 seams of the Camphausen pit, and No. 4 seam in the Kreuzgraben mine. The *modus operandi* is as follows: At the end of the day a number of holes, about 40 inches deep and 10 feet apart from each other, are drilled in the cutting. A water nozzle is inserted in the hole, the orifice of which is hermetically closed, and then immediately, or several hours afterward, the pressure is applied. The water injector is from 30 inches to 40 inches long, and it is connected by means of a piece of indiarubber tubing to the general water conduit installed in the galleries. The pressure of water is then maintained for from eight to twelve hours, and when the hewing is subsequently commenced, there is said to be absolutely no production of dust. The latter is saturated with water and the coal is moist. During the day the atmosphere maintains its transparency, and no sparking is noticeable in the lamps. The earthy bed of the seam becomes softened, and this facilitates the holing and removal of the coal to which the dust adheres. In view of these favorable results, the method has been adopted gradually in all the dusty portions of the above mines. The success of the device depends upon the degree of consistency of the coal, the amount of the pressure, and the volume of water used. In No. 3 seam of the Camphausen mine a pressure of from 120 lbs. to 150 lbs. continued for eight hours in two bore holes, with an area of $19\frac{1}{2}$ feet of cutting, was found to be sufficient to moisten all the coal hewn in the subsequent shift. The water penetrated 5 feet beyond the depth of the bore hole, and it was distributed over a larger quantity of coal than the area of $19\frac{1}{2}$ feet. With a pressure of 300 lbs. in No. 4 seam in the Kreuzgraben mine, maintained for sixteen hours, it was found that the coal was moistened 13 feet above the last bore holes. The coal has, of course, to be taken quickly after the cessation of the pressure, so that the bulk moistened has no time to become dry.—*American Gaslight Journal*.

PAMPHLETS, REPRINTS, REPORTS, ETC., RECEIVED.

Proceedings and Addresses at Sanitary Convention, Charlevoix, Mich. : Michigan State Board of Health, Lansing.

Social and Medical Aspects of Insanity : John Punton, M.D., Kansas City, Mo.

Appendicitis : A. Vanderveer, M.D., Albany, N. Y.

The Therapeutic Action of Tonica Water : J. W. Small, M.D., New York.

Treatment of the Various Forms of Pulmonary Consumption by Inoculation with Vaccine Lymph : J. Hilgard Tynedale, M.D., New York.

Bulletin of the American Academy of Medicine : Charles McIntire, M.D., Secretary, Easton, Pa.

Report of the Observatory of Yale University, 1890-91 : Robert Brown, M.A., Secretary, New Haven, Conn.

Reports of the Managers and Officers of the Friends' Asylum for the Insane : Philadelphia, Pa.

Report of the Trenton Eye and Ear Infirmary, 1890-91 : Trenton, N. J.

Report of New York Orthopædic Dispensary and Hospital, 1890 : 126 East Fifty-ninth Street, New York.

Cause and Prevention of Diphtheria : G. C. Ashmun, M.D., Cleveland, O.

The Sanitary Improvement of Stagnant Lakes by the Seashore, as Exemplified at Virginia Beach, Va. : Professor Jôseph H. Raymond, M.D., Brooklyn, N. Y.

Resection of the Optic Nerve : L. Webster Fox, M.D., Philadelphia, Pa.

The Therapeutics of Kronenquelle Water : Professor James, M.D., M.R.C.P. : Trübner & Co., Ludgate Hill, E. C., London.

Territorial Insane Asylum Report : Dr. L. C. Toney, Superintendent, Phoenix, Arizona.

Care and Detention of the Insane : Dr. W. B. Fletcher, Indianapolis, Ind.

The Neglected Code : W. Carroll Chapman, M.D., Louisville, Ky.

Report of the Officers of the Retreat for the Insane : Hartford, Conn.

Eleventh Inaugural Address of Clark Bell, Esq., President of the Medico-Legal Society, 57 Broadway, New York.

Vivisection. Five Hundred Dollar Prize Essays : George T. Angell, 19 Milk Street, Boston, Mass.

Report of the Superintendent of Public Instruction to the Board of Education of Brooklyn, N. Y., 1890 : William H. Maxwell, Brooklyn, N. Y.

ANNOUNCEMENTS.

THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION will hold its first annual meeting at the hall of the College of Physicians, corner of Locust and Thirteenth streets, Philadelphia, Pa., Thursday, Friday, and Saturday, September 24th, 25th, and 26th, 1891, under the presidency of Dr. G. Betton Massey.

Physicians interested in the discussion of electricity in medicine are invited to attend without further notice.

HORATIO R. BIGELOW, M.D.,

Chairman Executive Council.

WILLIAM H. WALLING, M.D., *Secretary,*

2005 Arch Street, Philadelphia.

THE INTER-CONTINENTAL AMERICAN MEDICAL CONGRESS—Office of the Chairman of the Committee on Permanent Organization, Cincinnati, June 6th, 1891.—The Committee appointed by the American Medical Association to effect a permanent organization of the Inter-Continental American Medical Congress met at "The Arlington," Washington, May 7th, 1891. The following officers were elected : Charles A. L. Reed, M.D., Cincinnati, O., Chairman ; J. W. Carhart, M.D., Lampasas, Texas, Secretary ; I. N. Love, M.D., St. Louis, Mo., Treasurer.

On motion, the officers were appointed a special Committee to draft a Constitution, and report the same at an adjourned meeting of the General Committee, to be held at St. Louis, Mo., Wednesday, October 14th, 1891, when the time and place of meeting of the Congress will be decided, and permanent officers be elected.

CHARLES A. L. REED, M.D., *Chairman.*

J. W. CARHART, M.D., *Secretary.*

THE SANITARIAN.

SEPTEMBER, 1891.

NUMBER 262.

THE BENEFICENCE OF DISEASE.*

By A. N. BELL, A.M., M.D.

THE first thought which this title suggests to the unreflective mind is, that it is in conflict with the almost universally popular belief that disease is an independent, active principle or entity, the result of sin—a penalty for the transgression of some physiological or sanitary law—which is identified with the punishment of our first parents for partaking of the forbidden fruit; a belief which, logically considered, without any conception of organic structure, would imply that man, as originally constituted, was intended to occupy this world forever.

That disease was unknown in the world before the fall of Adam is only equally true with the statement that so was all knowledge of the concerns of mankind unknown.

It is not my purpose to analyze the sacred record with regard to such special manifestations and miracles as appear to have been adapted by the Creator to the comprehension of man in his primitive state, or to call in question their design; but to consider disease as an essential condition of life, instituted for a beneficent purpose.

I have so long entertained this belief and have had such frequent opportunities of testing its practical utility, that, to my mind, it now amounts to a thorough conviction.

For illustration: About thirty-five years ago I was called to a very sick child, about eight years old, the daughter of a learned but exceedingly sensitive clergyman. I found him in

* Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5th, 1891.

the room with the child, walking the floor and wringing his hands, and otherwise giving vent to his feelings by prayer ; with frequent appeals to God to know why his dear child should be so stricken. " Oh, my God," he cried, " for what is this affliction sent—what has my darling child done that she should be called upon to suffer ?" and by various similar expressions greatly disturbing to the patient and agonizing to himself.

I, of course, led him from the room and remonstrated with him, and had to repeat the process several times during the few days next following ; but finally succeeded in excluding him altogether, until the child had well-nigh recovered and he had become composed.

Some two or three months afterward, the reverend father, who, I had learned, was the editor of a church magazine (*The American Church Monthly*), called upon me and requested me to be kind enough to write out in substance what he had learned from me of the nature of disease, and allow him to publish it. I made a conditional promise, and after a few weeks I wrote out enough to make half a dozen printed pages, and without caption or signature, I sent it with a note : " Here is your baby, name it to suit yourself."

It appeared in his next issue under the title of " The Goodness of God Manifest in Disease."

This was in 1857. Three years subsequently I re-wrote the article and made it the concluding chapter of a little book called " Knowledge of Living Things," published by Bailliere Brothers, New York, 1860.

What follows, comprises the substance of those articles, in conjunction with more knowledge of the structure of the human organism and continued reflection upon the subject.

Every organized being and every organ and tissue of every such being, even the hairs and nails, and the most minute nerves after they are lost to view under the most powerful microscope, are now known to be composed and maintained by living cells. Each one of the cells thus incorporated is possessed of an individual life of its own, has a period of development and maturity, possesses the property of reproduction, and dies. Life presents itself in the organism as the sum of these vital unities. It is maintained by the circulation of the

blood, which is also for the most part composed of living cells ; and the processes of organization and function are sustained, or otherwise, according to the conditions of the blood supply, and of the organ or organism to which it is distributed. So that all irregular actions, disturbances and pains which follow, are just as much in accordance with the laws which govern the existence of a single cell, as if the cell relied on its own independent action. And all the changes that take place, whether favorable or unfavorable to the continuance of life, are based upon the same fundamental laws.

The cells exist before the being which they organize, and survive it after the play of its functions has been arrested, insomuch that the life of the organism throughout is the resultant of the life of the cells which constitute it ; their individual existence being co-ordinated to subserve a perfectly definite object. When this co-ordination is interfered with, the result is disease. The favorable or unfavorable influences determine whether the already existing parts or cells persist, increase or diminish ; whether the conditions necessary to the varied play of the organic functions remain, or whether the machinery of life is arrested by the change or cessation of these conditions.

The organism, like the cells of which it is constituted and by which it is maintained, has a period of development and growth ; a period of middle life, in which the functions strive to maintain an unaltered mass ; and an epoch of decrease or decline, which is concluded by natural death. It is only in accordance with these conditions that life is embodied.

The world was not made for man alone. His life is linked with the plants and animals which co-exist with him, and these are the issue of long anticipations and preparations.

Not only the comfort, health and the degree of civilization, but the very existence of mankind in any given locality, depends upon the state of the earth, the atmosphere of the earth, the climate of the earth, and the productions of the earth. He is placed in a system where all the changes produced in other objects occur according to a relation existing among the substances changed, and his own organization participates in all these things that surround him. He has been endowed with a degree of intelligence equal to the necessity of determining

the relation of these things to his health and life, and what he ought to do for himself is as abundantly indicated by the knowledge of his organization and powers, as the uses of any machine is understood by an acquaintance with its construction.

The nature of the human organism is such that a most intricate connection is established between the organic functions, and this connection has a constant relation to the necessity of harmonizing the functions and keeping them in sympathy with each other.

The constant physical and chemical changes which accompany life depend upon the various reciprocities which are produced by the work of the different parts of the body: The assimilation of what is received, the elimination of that which is useless, and the restoration and maintenance of the organs by which these operations are effected.

We need no reasoning to convince us that an organism so curious and so wonderfully perfect in all its parts as the human body was designed to continue as long as the material composing it and the conditions to which it is exposed will admit of, and that upon us devolves the duty of giving it that continuance.

The preservation of health is an incumbent duty. We must preserve it in its perfect state, that in which the powers of the constitution can be most effectually exerted. All the health and strength of which we are capable were intended for use; and any unfitness for the functions of life is a partial death, by a weakening of the compensating powers of the system. The life and activity of every part is merged into such a perfect organism, that all the organs composing it are united together in a bond of mutual dependence, and the complete performance of the entire series of actions is necessary for the healthy maintenance of any one action. All the functions are so completely bound up in each other, that none of them can be suspended without seriously disturbing or causing the cessation of all the rest. Hence if any one organ is diseased, all the other organs are embarrassed.

We are all so placed that there are very few of the objects surrounding us which may not be serviceable or hurtful; nor is that service to be obtained or injury avoided otherwise than

by an acquaintance with things external, and their relations to our existence. The more exact our knowledge of this kind is, the more we lessen the calamities and add to the comforts of life.

Our knowledge of external things wholly depends upon our sense-perceptions. To our senses we trust directly, and by their cultivation we become acquainted with the relation of external things to health, and gain the power of increasing and varying the facts upon which we rely for guidance.

When the body is in full health and strength, the mind is so far assisted thereby that it can bear a closer and longer application. Apprehension is readier, imagination livelier, the compass of thought is more capable of enlargement, perceptions can be more quickly examined and more exactly compared, and a truer judgment can be formed. We can in all things have a clearer understanding of our relation to external things, of that which is best for us and of what is most for our interest, and thence determine our actions more readily, and persist therein with greater resolution and steadiness.

It is in this way that the soundness of the body is serviceable to the mind—each needs, each helps the other.

But the lifetime of man is perfectly consistent with the temporary existence of the cells of which his body is constituted, and his relation to the conditions which surround him. Under the most favorable conditions, parts of his frame that are concerned in development unceasingly accumulate the necessary particles by a process as beautiful and systematic as it is mysterious and sublime ; until, ultimately, the growth peculiar to the species and the individual is attained.

At this point the preponderance which before existed in the action of the exhalants over the absorbents ceases, and all is equality. Ere long his exhalants fall off in their wonted activity ; the fluids decrease in quantity ; the solids become more rigid ; and all those changes supervene which characterize the decline of life. But death may occur at any period of life, a few only ceasing to live by the effects of age alone.

The duration of life varies according to numerous conditions and circumstances : The original constitution of the individual, the habits and occupations of life, locality, and various

other causes, some of which, accidental or otherwise, are inappreciable before their fatal effects are encountered.

Latitude, elevation, nature of the soil, degree of cultivation, relative position in regard to mountains, forests, rivers, etc., and general aspect of the neighborhood, all modify the condition of man and prove his adaptability by such effects as serve to make him understand his relations to what is around him.

Man's relation to these things is known by their effects. And with the faculty of reason for his guide in the prosecution of his purpose, he continually risks the consequences of his free agency by fortifying himself against recognized conditions inimical to his health and life, or by boldly setting them at defiance in the irregularities of his conduct.

Disease in all its aspects is no less constant than the physical phenomena of the universe. The more attentively it is studied, from the earliest records of it to the present time, the more evident it appears that not a single one of the many diseases described in ancient or modern times has wholly disappeared, or that a single new one has been discovered. The same and all exist to-day, as ever have existed, and with equal liability to assert themselves under the same conditions as their wont at any period in their history.

The Divine institution of disease in relation to man's free agency and the qualities of natural phenomena suited to the whole organic world, requires that there should be more or less uncertainty and irregularity in its action. Diversity and dissimilarity are everywhere manifest, and not less so in disease and its results than in the classes, orders, genera and species of the animals and plants ; individuals of the same species are not unfrequently very dissimilar.

Disease forms no exception to the Divine arrangement of natural phenomena. The beginning and end of human life are only steps in an eternal existence. Death is the completion of life, but if disease had no other purpose nor end than death, it would be an anomaly in the works of the Creator, involving an arrangement of vitality without salutary tendencies. Like our own handiwork, which has in itself no provision for repair, we should wear out ; labor and sorrow would be the end of all our days ; life would be a burden, health beyond hope, and eternity a new creation.

The gratification which the reasoning faculties constantly seek, even if it involve a sacrifice of individual health, discloses truths of universal application. And as man tastes of the delights of intellectual action and gives way to the impulses of his nature to pursue them, he will see in disease a providential mercy to encourage his willing submission to it and to mitigate its severity. As its pains are but temporary, he can find strength to bear them patiently, if not to welcome them in the thought of the enduring good which they are intended to work within him.

The uncertainty of the issue in any disease, however slight in the beginning, is evidence of its merciful object. Were it otherwise, were our bodies so constituted as never to be sick but unto death, how appalling and hopeless would be the condition of man—hardened in sin, by the deliberate postponement of immortal concerns on account of the certainty of time ! But the uncertain duration of, and occasional recovery from, even the most fatal diseases, guards and secures their fitness for the common purpose, and prevents them from being any exception to the Divine arrangement.

But let us go further and suppose disease to be of one kind only, and always fatal at a particular period. Then the case would be much aggravated. A death-bed repentance would be the universal reliance, for while health continued there would be no concern for a future state. Feeling sure of time for the necessary preparation, convenience and necessity would take the place of duty, and the deceptions of weakness and bewilderment, instead of strength and clear perception in the full enjoyment of health and faculties, would determine the chances of eternity.

On the other hand, people sometimes die without the intervention of disease—are suddenly cut off in the full possession of health. But such deaths are rare and exceptions to the general rule. And how would it be if they were the rule instead of the exception ? How indescribably dreadful would be the fear of certain sudden death ! The whole of life would consist in the dread of impending danger ; pleasure would be unexperienced and unknown, and civilization among the things that are not.

Indeed, it is only by the present arrangement of disease that its Divine origin can be appreciated and its beneficence dis-

cerned. In any other way it would have no analogy to the diversity everywhere manifest in natural phenomena, nor would it serve the merciful purpose for which it was ordained.

Disease was not instituted simply as the road to death, or it would have been uniform and certain in its course. True happiness consists in the influence of religion, to which the whole of life should be devoted.

That fulness of communion which actuates the most kindly emotions, induces peace, inspires love and waits for heaven, is more or less the fruit of disease. It brings out and nourishes all the finest feelings of human nature. When strength is laid low and man is made to see and feel his dependence upon his fellow-man, who that has watched and studied the motions of the faithful physician and seen the sympathy of his full heart overflow, lest through too much confidence in human aid the purpose of God may not be fully accomplished—who has seen this and not felt the benefit of the sick-room? Or, again, when the surgeon has to take the responsibility of hazarding the most intense suffering with the least bare hope of relief from impending death; with what sympathy, what self-denying devotion, the wife, the mother, the sister, the friend, ay, the enemy even, and the most abandoned of mankind, all find their feelings softened under such circumstances. But again: when disease appears in its most appalling aspect and the heart of the nation is stirred by the advance of a fatal epidemic on a neglectful community, to keep itself fortified against such an event, but instead, is beset roundabout with the most favorable conditions for the reception and propagation of such a disease, and the life of thousands, it may be, is made to depend upon the fortitude of the practical sanitarian, who is called upon to defend such a community until it can be aroused from its sleeping indifference and made to bestir itself by the use of its reason—who that has witnessed such scenes is not ready to confess that it is in mercy and not in wrath that God has sent disease into the world?

All conflict with this conclusion is removed by our Lord's blessed answer to the question, "Master, who did sin, this man or his parents, that he was born blind?"

"Neither hath this man sinned nor his parents, but that the works of God should be made manifest in him."

The apparent punishment of Azariah with leprosy for profanity, and of Gehazi for covetousness and falsehood, was in reality a correction in mercy. And in like manner were the punishments of the Israelites.

Disease is nowhere manifest as mere punishment, but as a correction in mercy for the salvation of the soul. Even when it is brought about by our own misconduct, it is consonant with this view, because we are admonished by it to be ready for death.

We are corrected against the imprudence committed for future improvement in *ourselves*, not punished that others may profit by our example, which is the true design of punishment. Moreover, as a general thing, there is no connection between acts performed and disease. Indeed, if this were the case, we should find that the righteous and the wicked could be designated by their relative degree of health, and we should be constantly led to inquire, "Who did sin, this man or his parents?"

It is conclusive that no manner of life can be alleged in justification of disease. From infancy to old age, the innocent and the guilty are alike subject to its uncertainties.

The inherent aversion of man to live for the future needs a constant monitor.

There is no condition in which we are in so much danger of forgetting that an eternity awaits us, as when we are in the uniform enjoyment of health. The purpose of disease may indeed be disregarded, unheeded; in which case the visitation will be unprofitable, as it was to the Philistines, but its purpose is not on this account altered. A thorough conviction of God's love and merciful providence in all His dispensations is the only adequate proof of a submissive spirit.

The benefit of disease is to be obtained by endeavoring to discover its nature, how it may have been avoided and how its recurrence may be prevented as long as possible, consistent with the human organism, and finally, by a meek submission to the Divine will.

It is thus that the Creator, having designed man for a higher sphere, has not only given him the capacity of knowledge and virtue, but has instituted disease as a sentinel on the threshold of his future existence.

ALCOHOLISM AND HEREDITY.

By J. A. D'ARMAND, M.D., Davenport, Iowa.

THE medical profession has for years been as much at sea, and as wildly influenced by personal prejudice, as other people, concerning the various politico-social questions relating to alcohol. Complex questions involving not only the betterment of the race, but also granting to each humble citizen of a republic the fullest measure of freedom, find many and various solutions, even at the hands of men who honestly endeavor to lay prejudice aside and work with the earnest, honest hope of securing the greatest good to the greatest number.

In order that the very difficult subject of inebriety might be the better handled, hosts of patient investigators have studied the effects of alcohol on the organism in health and disease ; on the animals ; on every organ of the human body ; on the mature adult, and on the infant at the breast. This study, so praiseworthy in its design, and so fraught with good results in its practical application, has led to theories as multitudinous as they are wild. The widest extremes are made to meet, and the oil of speculation is made to mix with the muddy water of doubt. That such a condition of affairs should come about is not surprising, for it is true of all the investigations of great questions that bushels of chaff are garnered while only grains of truth are winnowed with patient toil and vexatious delays.

With the politico-social questions which agitate communities and States we, as medical men, have only to do as good citizens. With the medico-legal aspect of the questions relating to alcohol, our position as disinterested investigators, and as the recognized authorities, we should formulate theories and promulgate opinions with that care which is necessary in order that the confidence of those who look to us for truth may not be shaken. Enthusiasm, like might, cannot make right. Truth is, and must be, eternal, and the mistakes of

to-day are corrected to-morrow in every branch of human work and human labor.

One of the latest theories concerning the great question of alcohol refers to the hereditary effects ; and it is to this special point that brief reference will here be made. In studying the effects of alcohol on the human family, some investigators have observed a marked tendency to certain peculiar idiosyncrasies or dispositions in the children of alcohol-using parents. To such an extent have some of these traits been remarked that the theory has been advanced that the offspring of alcohol-abusing parents do, with sufficient regularity to establish a rule, inherit minds deficient in certain essential particulars, so that they are rendered, without any outside influence, unable to resist certain impulses reputed to be under the control of the will ; or they are, in short, not capable of resisting impulses which are, by common consent, regarded as very bad. This is a most pernicious theory, and it is to be hoped, for the good of future generations, that it never gets beyond the pale of theory. Every theory which tends to injure society and to block the wheels of progress should be promulgated with hesitation and accepted with many misgivings, if at all. Every good citizen who cares for the welfare of his kind, who loves his home and would guard it from scoundrels and law-breakers, must hope that this new theory is not true. Law-abiding people will see in this new theory a loophole of escape for all the dark-lantern brigands who rob because it is easier than honest labor, and who murder because it is the shortest cut to liberty. Any one who has had an opportunity to study the rosters of jails and police stations will have learned that intemperance is accountable for a very large proportion of commitments. The new theory says, in effect, that very many of these people were born deficient in the mental ability to govern their appetites, and, furthermore, that crimes committed while under the influence of liquor are not the acts of sane persons at all.

The criminal laws are based on the very excellent principle that a "man who commits a murder when he is drunk shall be hanged when he is sober." But if the man can't help committing the crime, and can't help becoming intoxicated, manifestly it is wrong to punish him for the commission of an

act he was powerless to avoid. The new theory takes the ground that there is a deficiency of nervous structure which renders the offspring of drinkers unsound and unequally balanced mentally. It has long been recognized as a fact that there often is a peculiar tendency in some families whereby the children all possess an inordinate desire for drink when they reach the stature of the average bar. It generally is true of these families that the *pater familias* has a fine appetite for alcoholics, of immaterial brand. If the father was a drinking man, the theory volunteers the conclusion that there is a nervous insufficiency in the make-up of the children. This is a theory, and all the fondling it has received from men whose business interests or fanciful notions have influenced their devotion has not removed it one step from the basis of theory, pure and simple, and improbable as well. If it were a fact that a child begotten by a father whose system was soaked with alcohol would inherit a mentality so deficient in one regard, why is it that the form of evil-doing takes such various forms? One child of inebriate parents will be a drunkard, another a burglar, a third a tramp, and so on. This peculiarity is based on the explanation that the ability to choose right from wrong is not there. Now, if this were true, why does it happen that the children of inebriates who receive the benefit of good schools and the home influence that marks refinement and civilization are not more liable than other children to become drunkards? We all have seen the sons of first-class citizens, parents who never drink, yet their offspring appear to improve every opportunity to become sots.

He who starts out to account for the drunkenness of the day by saying it is due to an inability to resist, offers a poor apology for non-resistance. There can be no absolute rule in these cases; but it is a matter of common observation that children who are reared in ignorance, poverty, and neglect make nine tenths of the drunkards. Drinkers commit most of the crimes wherein life is jeopardized. These being facts, why not attribute drunkenness to the failure to develop the nobler parts of the children's minds rather than to attribute their shortcomings to a deficient mind?

Mental alienists are well aware of the fact that a mind unduly developed is most likely to show signs of unreliability

sooner or later. Inventors are very liable eventually to turn their attention to perpetual motion, or a similar *ignis-fatuus*. The greatest bores of the age are the men who have a single scheme whereby impossible things may be accomplished by short-cut methods. The mind is a complex machine, and no part of it can be run while the rest lies idle without the value and usefulness of the whole being jeopardized.

Why should alcohol have such an effect on the offspring? Are there not, even now, many physicians who have made the matter a study who aver—wrongfully, however—that the liberal use of alcoholics by nursing mothers will not effect deleteriously the nursling? This fact would seem most natural when we take into consideration that the young and growing organism must receive much of the inhibited alcohol; but the results of observations have not been so uniformly marked as to challenge attention.

Following out this line of reasoning, why are not the peculiarities of systemic diseases more frequently marked in the offspring of parents suffering therefrom at the time of conception? Some years ago a case came to my notice that would seem to suit this theory. A man of fifty years, who had been an invalid from rheumatism for years, became helpless. He could not turn over in bed, nor feed himself. In fact, he could lie only on his back, with his knees drawn up and arms at right angles at the elbows. In this condition he remained for more than a year, and finally died. A few months after his death his wife gave birth to a child who is to-day a healthy youth. The wife and mother is a woman above reproach. Why hadn't that child rheumatism, or other bodily or mental defect?

A man eats opium for years; his system becomes shattered; he is a shadow of his former self; and yet his children do not have a predilection for an opiate bill of fare. So it is with chloral, and, so far as my observation goes, all the other drugs that men use to excess. Look at the human pigs who chew tobacco. Do their offspring inherit an uncontrollable appetite for the nasty weed? Thank the Lord, no! And yet one would suppose that if filthy habits could be passed down, this nastiest of the vile would get there surely.

Why people drink, and how the habit is formed, will find

several strides toward solution to the reader if he will but go into any of the beautifully lighted saloons of an evening. He will find there gamblers, whose love of excitement, aided by an occasional glass, keeps them happy. He will find working-men, who are spending their hard-earned cash in drink, the while talking of the strike that is to make more drink possible but less bread probable. He will find the "Chollies" and the "old fels," who form the masculine *crème de la crème* of polite society, as viewed from a rich paternal bank account. These youths are taking fine drinks for no reason under the sun, unless it be to give a one-of-the-boys look to a character which otherwise would be decidedly doughy. You will find there men who drink to keep warm in winter and cool in summer; who drink to forget sorrow, to drown grief, to celebrate an event, or banish a thought.

But you never will learn all the reasons why men drink. Intemperance, in fact, is a vice, and as such it is a

" — monster of such hideous mien,
That to be hated needs but to be seen;
But seen too oft, familiar with its face,
We first endure, then pity, then embrace."

Drunkenness is a habit, and, as such, is cultivated. While there may be, and are, cases wherein men and women have naturally an uncontrollable desire for drink, yet these are the exceptions, and they cannot even generally trace the cause to an ancestry of drunkenness. The appetite for liquor is cultivated, for not one in ten of those who are abusers of alcoholics cares for the taste of liquor—it is the effect they are after. It is the boozy feeling, in which all is peace and happiness, that they are after, and they find it. No doubt many men are made bold by drink; but to say that a man who takes liquor in order to translate himself into a condition of mental lethargy is insane, is to deny to the man reasoning powers. The man who drinks does it for a purpose. Men do not drink by accident. When a man can reason that whiskey will befuddle him into happiness he is not insane clear through. If he drinks to brace up his courage, he must reason out the act. Because persistent devotion to drink finally renders him powerless to stop, does not disprove the fact that there was a time when vigorous measures would have broken a chain once made of straw, but now is of strongest iron.

Suppose that this theory is true. Suppose that the children are unable to control their appetites, and are not able to distinguish right from wrong. Then we might as well begin shaking hands with our friends, for lots of them will be in the mad-house very soon. If they may inherit the mental weakness of not being able to keep step with morality and decency, how are we going to know that the time has not arrived for their life imprisonment to begin? And, by the way, it is not amiss to observe that it is largely the proprietors of "retreats" who have discovered this new theory of hereditary lameness from alcohol.

If a man is not able to control his appetite, would it not be best to shut him up while he lives? or would you let him run until he has filled some citizen full of cold lead, and then shut him up?

But, says the apologist, if you treat the head of the family as a criminal, look at the stigma you put on the children, who, even if educated by the State, and made good citizens, will ever have to bear the reproach of having had an ancestry that did time in durance vile. But would not even that stigma be better than an infancy, youth, and adolescence of ignorance, deprivation, and want, with little or no chance for place in the great race of life? Would it not render the coming crop of helpless humanity less? In doing that it would at least decimate the school where ignorance and crime are teachers. Of course, these retreats where whiskey is pumped out of a man and aversion pumped in will cut no figure in this case. If a man's system is defective, he surely can't be helped any. You might as well talk of putting a new liver into a man as to correct a defect caused by an atrophied nerve centre. The leopard may change his spots in Barnum's hands, but the retreats can't do the work as yet. All this talk of mental unaccountability is bosh when applied to drunkards in general. Men who drink know perfectly well what they are doing, and it will be a cold day for good government when the scope of sympathy is extended so as to include the wretches whose excuse for wrong-doing is nothing more rational than that they were drunk. Punish a man who gets drunk. Put him in the work-house. Make him work. Make him learn in the hard work-shop of painful experience that the way of the transgressor is hard. When he gets full

and brains a good citizen, hang him, and let all of his ilk know that they who do wrong must suffer. Don't let us be forced to divide this country into two great classes—the fools who are outside and the villains who are inside of the “retreats.”

The liquor question can be settled when drinkers are given the cold shoulder by decent people in the upper social scale, and when they are adequately punished on both scales.

Is it true that the offspring of inebriates are generally bad? Is heredity or are association and example to blame for continuous inebriety and crime in families? These are questions not so easily decided as some writers would have us think.

Before noticing at length these points we must remember the truth of the adage that “one swallow does not make a spring.” The beautiful and accomplished daughter of the millionaire elopes with the ignorant black or white coachman. Nobody would look for the explanation of this wild freak in the sexual shortcomings of the parents. Some idle crank finds brief enjoyment in rushing out of dark alleys and hugging roseate but terrified femininity. Nobody thinks his father's life ought to have a moral raking over. Actuated by a sexual or other perversion another idler finds enjoyment in cutting off the hair from young women's heads. Why would you not find some reason for looking up the history of these people's ancestral sobriety, just as surely as you would when some inoffensive citizen is stabbed to the heart by a man who, to save his neck, pleads that he did not know what he was doing? Out of all calculation in matters of this sort it is absolutely essential that we eliminate those cases wherein the perversion of a vegetative function stimulates to activity a craving which is not so much not under control of the will as is not encouraged to be under it.

Two men meet over the settlement of business matters. In the course of adjustment one calls the other a liar and gets knocked down for his rudeness. In the determination to get revenge the vanquished starts out in quest of courage and a gun. He gets the first in the saloon and the other equally as easily. Then begins a hunt for the man who struck him, only interrupted by a steadfast devotion to keeping the courage furnace well filled. After awhile accident may put in his way

his late antagonist, and if the courage and muscular steadiness are in right proportion he may shoot and kill somebody. What in the world is the use in going into the dead past, and raking over the musty records of the murderer's parents to find out if this man was not forced to do this act? At the time he started out on his unholy mission he was sane, and while sane he resolved to do an unlawful act. Maybe he did not resolve to kill the innocent man his uncertain aim effected, but he went on an unlawful mission, and he should be punished for that act just as certainly as anybody should for murder at any time. There is not a man in a thousand who does not know how liquor affects him. The drinker gets what he goes after every time. If a man will drink when he knows that while under the influence of drink he is quarrelsome and violent in his actions, he cannot plead irresponsibility after the act is done.

There can be no doubt but that close communion with ardent spirits will in time ruin mind and body, and the time will depend on the steadfastness of the devotion and the temperament of the individual. There is not in that fact any warrant for the conclusion that a man who drinks to excess cannot govern himself or is insane, both when he is in liquor and when he is not. Would it not be better to bring such men up with a start before the habit is an ungovernable passion, than to feel sorry until it is everlastingly too late to do anything else? The free moral agency of man is a birthright which he cannot dispute and preserve his identity. When the State comes to recognize the truth that crime and ignorance go hand in hand, a great stride will be made in lessening wrong-doing. In this matter I recognize the fact that genteel crime is on the increase; that pious men of education chase the nimble dime with more zeal than discretion, but there are in every city and town in the land children who have no chance to do other than become vagabonds and toughs. From the cradle they are treated as such, and as years are added to their lives they become more and more just what they are trained to be. If you treat a boy as a thief and a ragamuffin he sooner or later becomes one in fact. If everybody about a family of children drinks and indulges in drunken carousals, it is safe to say that these children will follow in the

footsteps of their examples. Large sums are paid every year to carry the news of a merciful Father's love to heathen lands, while thousands grow up in ignorance, idleness, and crime here at home, knowing little of the tender care of a father, whose love seems to get no nearer than around the block. In the fulness of time maybe the love of conquest and display will be cast aside, and then the little heathen, who wants only a chance to make a good man of himself, will not have his future marked out for him in the slimy slough of ignorance and crime. Every chain is just as strong as its weakest link, and no State can be great that has so much to keep its people from getting away from the habits of life which dam up all the avenues of approach to good citizenship.

Drunkenness is a crime, and as such it should receive the sentence of condemnation. It is a crime against decency, order, and good citizenship, and more than all, it is a crime against the children of the offender. The glory and greatness of a State depend upon the intelligence and virtue of its people. Then no State can afford to let any mock sentimentality interfere with giving to every child in the land a chance. No child whose education is neglected and whose life is brought face to face with squalor and want and crime has a fair chance in the great race of life.

When the State will see that its people are given the rudiments of an education, and the youth of the land are given a chance to be men and women of worth, and not forced to follow in the footsteps of a besotted father, freedom will be larger in the minds of the people, even if it is no larger on our banner.

Heredity during the last decade has had a good deal of attention, and many things that we were taught to regard as mere cussedness are now charged up to the account of a defective ancestry. Although much has been done in this special line, and much that has had only the authority of a prejudiced few as authority, it is evident to the student of physiology and psychology that much that has been done has not yet reached the round of accepted fact. When all the bearings of licentiousness, intemperance, and the almost innumerable vices which so many have singly, or in groups, are traced

through generation after generation, doubtless much will be learned, and heredity, recognized as possessing laws immutable and inviolable, will no longer form a dumping ground for wild and improbable theories.—*The Times and Register*, August 15th, 1891.

TOBACCO AND PHYSICAL HEALTH.—Dr. J. W. Steaver, College Physician and Instructor in Athletics at Yale University, reports that he has made a comparative study of the users and non-users of tobacco in the Senior Class during the past four years, and from his measurements he sums up his statistics as follows :

Average increase in lung capacity in *users* of tobacco, .15 litres ; *non-users*, .25 ; or an increase of 66 per cent greater for non-users.

Inflated chest measurements, in *users*, .0304 metres ; *non-users*, .0364, or an increase of 19 per cent greater for non-users.

Height, in *users*, .0169 metres ; *non-users*, .0202, or an increase of 20 per cent greater in non-users.

Weight, in *users*, .4 kilogrammes ; *non-users*, .5, or an increase of 25 per cent greater for non-users.

With regard to the possible effect on scholarships, the statistics are : Of those who received Junior appointments above dissertations, 95 per cent have not used tobacco ; of those above colloquies, $87\frac{1}{2}$ per cent have not used tobacco ; of all who received appointments, $84\frac{3}{10}$ per cent have used tobacco ; of the entire class, 70 per cent have not used tobacco.

Dr. Steaver says that these figures accord with statistics that he has kept for the past eight years, the greatest percentage of gain always being on the side of those who do not use tobacco. The greatest variation in the two years' widest part has not been more than four per cent. Some of the students who are classed among the non-users do smoke, but not oftener than once a week, or at such long intervals that the tobacco is apt to have little or no effect on them. Dr. Steaver states that the prominent athletes do not smoke or otherwise use tobacco as a rule, Calhoun being the only exception in college. All the candidates for the crew abstain from tobacco.

EPIDEMIC INTESTINAL DISEASES IN ALBANY AND VICINITY.*

By JOSEPH D. CRAIG, A.M., M.D., Lecturer on and Demonstrator of Anatomy
in the Albany Medical College, Albany, N. Y.

I DESIRE to offer in this address, in fulfilment of my obligation as vice-president of this society, the results of a collective investigation into the causes of epidemic intestinal diseases, which have prevailed in Albany and vicinity during the months of December, 1890, and January, February and March, 1891. In response to the following circular letter, sent by me to known members of the medical profession in the counties of Albany, Rennselaer, Schenectady, Columbia, Greene, Schoharie, Saratoga, Herkimer, Fulton and Montgomery and to others living in the counties of Clinton, Essex, St. Lawrence, Erie, Onondaga, Oneida, Otsego and Washington, *one hundred and eight* replies were received :

NO. 12 TEN BROECK STREET, }
ALBANY, N. Y., February 16, 1891. }

DEAR DOCTOR : There have been prevalent in Albany and vicinity, since the first of January last, many cases of severe irritative diarrhoea and catarrhal enteritis with or without gastric symptoms. The same intestinal disturbance has been called, in some places, "Winter cholera." This form of disease has become so frequent as to amount almost to an epidemic, and, as a consequence, there has arisen great public and professional interest in the subject. At the same time typhoid-fever and an anomalous variety of fever, accompanied by irregular chills, neuralgia, and gastric and intestinal symptoms, have become epidemic in this section of the State.

It has become a matter of importance, both to the public and the profession, to ascertain, if possible, the causes which have produced such diseases.

I have, therefore, volunteered to make a collective investigation of the subject and invite an expression of opinion from the profession in this section of the State. Full information

* Semi-annual Address delivered before the Medical Society of the County of Albany, May 12th, 1891.

is particularly desired from places using potable water derived from other sources than the Hudson and Mohawk rivers. The opinions expressed will be properly tabulated and presented at an early date in a paper to the profession in Albany. A copy will be furnished you, if you desire.

Your co-operation is desired, and the favor of an early reply to the questions in the enclosed blank earnestly requested.

Very truly yours,

JOSEPH D. CRAIG.

COLLECTIVE INVESTIGATION AS TO THE CAUSES OF EPIDEMIC
INTESTINAL DISEASE IN ALBANY AND VICINITY.

A—1. Do diarrhœal diseases prevail in your practice to an unusual extent?

2. What is the source of the drinking water in these cases? River, well, or other water?

3. What unfavorable atmospheric conditions have these diseases followed?

4. Were any of the cases contracted in other places? If so, where?

5. What kind of drainage system have the houses in which these cases occurred, and into what does it empty?

6. What is your opinion as to the cause of such diseases, particularly in reference to—

(a) Drinking water?

(b) Atmospheric influences?

(c) Other causes?

B—1. Have you had, to an unusual extent, in your practice—

(a) Typhoid-fever?

(b) Anomalous or other fevers?

2. If so, what cause did you assign?

(a) Drinking water?

(b) Importation from other places?

(c) Direct contagion?

(d) Local sources of infection, as privies, cesspools, sewers, etc.?

3. Is there any known relation in your cases, or do you suspect any relation to exist between drinking water and drainage system?

C—Can you remember a previous epidemic of like intestinal disease, where like atmospherical conditions prevailed? If so, will you give particulars? •

D—Will you kindly report any case where the relation of cause to the disease has been POSITIVELY ascertained?

E—Remarks :

From

From the information contained in the replies to this letter, and from information obtained by means of personal investigation and inquiry from other sources, the conclusions formulated in this address have been derived. It was also my purpose to tabulate the answers returned, but owing to the difficulty in deciding upon a convenient and simple basis of classification this has been found to be impracticable. A number of facts, concerning like epidemic diseases occurring in England, which pointed very strongly to contaminated water as an efficient cause, have been excluded from consideration. Investigations in other places contributing to the support of other theories of causes have also been excluded as foreign to the purposes of this paper. It has not been my object to study either abstract propositions or general theories of causes, but the more simple purpose, of considering only those facts which gave indications of the sources of diseases in the epidemic just past, has alone engaged my attention.

I have sought for an expression of professional opinion, and have endeavored to make what seem to me to be reasonable inferences therefrom. It is an estimation of probability only, and it is reasonably certain that no method of scientific investigation into a subject of the character of the one to which our attention is drawn to-night can do more at this present time. At least, I do not know of any records which show with the exactness of science the relations of cause and effect in any epidemic like unto the one through which our people have just passed. Bacteriological studies and chemical analyses have contributed many valuable facts to the elucidation of the problem of the relation of water to the public health, but have failed, so far, to do more than to indicate the probabilities of the case. Such studies and analyses do not fall within

the limits of this paper. Others are working along these lines, and in due time will make public their result. By any methods of investigation, then, at present available, we can do no more than estimate probability. As the inductive method more often than the scientific one is, from necessity, the clinical method and produces valuable and approximately correct results, it is practicable for the purposes of this paper.

It has sometimes seemed to me as if the greater number of the profession had committed themselves to some *one* theory of cause of the epidemic just past, whereby they had become partisans and biased in their belief, and had lost sight of the fact that either the severe gastro-intestinal inflammation or the typhoid-fever might owe their origin in different cases to any one of a number of independent or contributing causes. It is by reason of the multiplicity of these independent or contributing causes, acting separately or in combination, that this problem has become so complicated and so difficult of solution.

I think it is fair to say, so far as the purposes of this paper are concerned, that we have had prevailing in Albany and vicinity during the past winter :

1. TYPHOID-FEVER :

(a) *Running a typical course*, the proportion of these cases being to the whole number less than the average in other epidemics.

(b) *Running an atypical course*, with one or more of the prominent symptoms of the disease absent. These cases comprise the greater number.

The case of Miss T. illustrates this type. In this case the fever wave of the first week was not typical of typhoid-fever. There were no petechiæ ; neither was there gurgling or tenderness in the right iliac fossa. She died between the third and fourth week, and at the autopsy well-marked ulcerations of the patches of Peyer and enlargement of the mesenteric glands were found.

(c) *Of abortive forms*, with fairly typical onset and fever wave, but quickly receding about the second week.

2. MALARIAL FEVERS :

Almost exclusively prevalent in places away from the Mohawk and Hudson River centres of population.

3. OTHER FEVERS :

Not typhoid—probably due to sewer gas poisoning, the specific cause and course of which are unknown.

4. LA GRIPPE :

The abdominal form of which principally concerns us in this address.

5. DIARRHŒAS :

With or without gastric or hepatic symptoms ; of all grades of severity ; owing their origin to well-known causes, being

(a) *Irritative*—due to improper food, impure water, etc.

(b) *Symptomatic*—particularly of typhoid-fever, acute enteritis, and la grippe.

(c) *Vicarious*—from exposure to cold and wet and from sudden changes in temperature.

6. CATARRHAL ENTERITIS :

With or without gastric symptoms—especially prevalent in Schenectady and in other places among people who have contracted the disease in Schenectady.

The type of this variety of enteritis is somewhat different from the ordinary form. The disease is more chronic, more angry, more severe than usual. I have called it for convenience the Schenectady type. In these cases, as a class, there are these peculiarities :

1. Subnormal temperature.

2. Resistance to the treatment usually effective in this class of cases.

3. Marked tendency to persist.

4. Liability to recurrence, and

5. Perhaps spreading by contagion.

The following cases, briefly reported, will illustrate this type :

I.—Fred D., of Albany, age eighteen, a strong, healthy young man of good habits, went to work for the Edison Company in Schenectady on January 12th, 1891. He secured board first on Union Street, and afterward on Nott Terrace. Drank copiously of the Mohawk River water at both places, but especially drank the Mohawk water at the Edison works. This water was always dirty and of bad odor, and increased rather than diminished thirst. Had more or less diarrhœa until January 21st, when he was suddenly attacked with

marked and severe gastro-intestinal symptoms, suffered great pain, was greatly prostrated, and had almost constant vomiting and purging. The discharges were thin, mucous, and very offensive. Reached home the same day in a state of profound collapse. From this date to January 27th, just about a week, it was impossible for him to retain even a few drops of water on his stomach. Remedies usually effective in these cases were useless with him. The temperature taken every morning and evening was subnormal during the entire time. On two afternoons there appeared to be a slight rise in temperature, but of this I am not certain. After the more acute symptoms had subsided and he began to get about again, his diarrhœa still persisted and continued for weeks, marked by several periods of frequent and painful discharges. The stomach only resumed its full physiological activity after a period of several weeks.

This case well illustrates the Schenectady diarrhœal disease among those who drank of the Mohawk River water, irrespective of other conditions.

II.—William D., Albany, age seventeen, also a strong and healthy young man, went to work for the Edison Company and drank freely of the Mohawk River water. Suffered from profuse, painful, long-continued and rebellious diarrhœa, but of less severe character than Fred D. in Case I. There was the same marked persistency and tendency to recurrence. All symptoms gradually subsided after a number of weeks following his return to Albany.

III.—Ralph S., Albany, age seventeen, another perfectly healthy young man, went to work for the Edisons about February 1st, 1891. Boarded first on Union Street, and afterward on Hulett Street. Drank well water at Hulett Street, none at all at Union Street. Drank Mohawk River water at the Edisons on the same days on which he drank well water in Hulett Street. States that the Mohawk River water was always dirty, and increased rather than diminished thirst. Two days after going to Hulett Street was taken sick. Sickness began with headache, followed by profuse and painful diarrhœa of very offensive substances. Had rise in temperature, with accompanying thirst. The next day vomited greenish, bilious material. Acute symptoms rapidly subsided, but

diarrhœa persisted for some time. With the exception of the rise in temperature the other characteristics of the disease were present.

Cases I. and II. seem to point to the Mohawk River water drank by these young men as a cause. Case III. is valueless in the estimation of causes. The Hulett Street well was known to be infected, as a man living in the same house and drinking well water exclusively had been sick with typhoid-fever for two months, and a woman also living in the same house, also using this well water, was taken sick shortly afterward. There was no sewer connection in these cases.

IV.—A large number of cases, reported verbally by Dr. Pearson, of Schenectady, whose accuracy as an observer none of us will question, all showed the same tendency to persistency, rebelliousness and subnormal temperature, and in one of which the prostration was so profound that death resulted.

V.—A case reported at Broadalbin, imported from Schenectady, kindly furnished by Dr. Finch. "This case," to use the doctor's own words, "has been a very severe and protracted form of diarrhœa, with attacks of vomiting once or twice a week. He has had no fever during the attack. He drank the Mohawk River water at Schenectady."

VI.—A case reported at Saratoga Spa. "A locomotive engineer, whose duty kept him between Saratoga and Whitehall, used drinking water at various stations. The diarrhœa was severe, also had pains in his bowels. Great prostration followed first attack, with a tendency to return of bowel trouble if strict attention to diet and rest was not adhered to. . . . This patient's wife also had a slight attack. No other cases in Saratoga."

VII.—Dr. Rivenburgh, of Middleburg, reports three cases imported from Schenectady, "severe in form, with vomiting and purging. Cases of local origin, mild."

VIII.—Cases reported by Dr. Charles McCulloch :

1. "J. S. W., employé on Schenectady branch of D. & H. C. Co., drank a large quantity of Mohawk River water and in a few hours was attacked with diarrhœa, which has persisted until February 20th, 1891, a period of two weeks."

2. "A large number of Italians, similarly affected from the same source, mostly acquired in Schenectady. *In any event, all drank Mohawk water.*"

IX.—Cases reported by Dr. J. C. Still :

Mild cases of diarrhœa occurred in his practice of *home* origin, and some imported from Schenectady. *Every one* of a number of young men who went to Schenectady suffered. *Cases protracted, convalescence slow.*

X.—Four cases reported by Dr. J. F. Wheeler, of Chatham :

“ These cases were imported from Schenectady among young men who went to work for the Edisons and drank Mohawk River water. They recovered rapidly under treatment and change. All returned to work again. Three drank distilled water from the exhaust and remained well. *One drank the old water, relapsed* and recovered again on returning to Chatham.”

XI.—Dr. R. H. Morey has observed in his cases “ great weakness and lassitude and the unusual length of time in convalescing.” Three or four of his cases were imported from Albany.

XII.—From Kinderhook the following was obtained :

(a) “ Mrs. W., of Kinderhook, visited Schenectady for two days. Came home and was confined to bed with diarrhœa.

(b) “ Mrs. H., from the West, stopped in some of the lower towns on the Mohawk, then at Hudson. Had profuse diarrhœa.”

(c) “ Nephew of Dr. W. came from the West and stopped at Schenectady about the middle of September. Had diarrhœa, which persisted as long as he remained in Schenectady. Yielded rapidly on coming to Kinderhook.”

XIII.—Dr. Jesse Crounse, of Altamont, sends the information that in his cases the “ type of diarrhœal disease is different from the usual.” “ Several cases imported from *Schenectady.”

It has been stated by several that this type of disease is contagious. The following cases point in that direction. The evidence, however, is not very strong.

I.—Case 6 above.

II.—Case reported by Dr. Ross Wilson, of Sandy Hill, to whom I am especially indebted for his great interest in this investigation. (Dr. Wilson sent out over two hundred circulars, and his reply is of great value.) He reports the following facts as bearing upon the contagiousness of this diarrhœal dis-

ease: "A son, his wife and child visited his mother here. The first three contracted a painful diarrhœa in Albany. His mother was prostrated with the same disease a few days later."

III.—Cases of Dr. Rivenburgh, of Middleburg:

1. "Mr. B. contracted diarrhœa while on a visit to Schenectady. His whole family suffered." "The cases imported from Schenectady were the most marked."

2. "Mr. O. went to Schenectady to seek employment, returned with diarrhœa and gave it to his wife, but of milder form."

3. "Mr. A. contracted diarrhœa in Middleburg and his family escaped."

In other words, cases that came from Schenectady were followed by other cases in the families of those affected. Cases of local origin did not spread beyond the persons originally attacked.

There is one other fact which seems to bear out the theory of a specific contagious principle as the cause of this diarrhœa. Whenever the cases were treated with antiseptics, particularly bichloride of mercury, then there was the most rapid recovery. This was noticed by several observers.

In considering the expressions of opinion contained in the replies, it is convenient to group the returns under the following heads:

1. Direct contagion.
2. Atmospheric influence.
3. Drainage and sewer gas.
4. River and other waters.

I.—DIRECT CONTAGION.

The question of the contagiousness of the Schenectady type of the diarrhœal disease has already been considered. The following has reference to the contagiousness of typhoid-fever.

If the replies received are at all an indication of professional opinion, it is certain that the great majority of physicians either do not believe in the propagation of typhoid-fever by direct contagion or treat such a means of communication with great suspicion. Of the one hundred and eight physicians who replied, *forty* expressed an opinion. Of these, *twenty-seven* do not believe in direct contagion as a cause of typhoid-

fever, while two were doubtful. Eleven considered direct contagion as an occasional cause, but inasmuch as three of these were from Schenectady, a city which is now well known to be in an extremely unsanitary condition, some allowance must be made for the accuracy of the observation. From perfectly reliable observers, however, information comes that some cases have been so traced. In one of these cases the patient had nursed a typhoid-fever patient and was herself attacked with the disease. Causes other than direct contagion were excluded. It is very probable that in occasional instances typhoid-fever may be thus acquired. A very few of the cases in the epidemic under consideration may be so accounted for, but direct contagion has not entered in any large degree as a causative factor.

II.—ATMOSPHERIC INFLUENCE.

The replies to the question of the influence of atmospheric conditions as a cause do not furnish us much of interest or importance. *Forty-nine* expressed the results of their observation. Of these, *eleven* did not trace any connection between the atmospheric conditions and their cases, while *two* regarded such conditions as the sole cause. *Two* others regarded the atmosphere as loaded with miasma, and believed such a condition to be the cause. The remainder, *thirty-four* in number, were fairly united in the belief that sudden changes in temperature, particularly from extreme cold to warmer weather, with falling barometer and much dampness or rain, were immediately followed, not only by an unfavorable course in those already affected, but also by a marked increase in the number of new cases. These observations apply to both the diarrhœal disease and typhoid-fever. As the action of such changes on the course and in the causation of disease is already well known, and as nothing especially new or conclusive was obtained on this point, it will hardly be profitable to spend more time in its consideration.

III.—DRAINAGE AND SEWER GAS.

The relation of drainage and sewer gas to the prevailing epidemic has excited considerable professional interest. *Forty-three* expressed an opinion. Of these, the physicians

of twenty-three places in which there is surface drainage and the cesspool system, but no sewers, state that there was

Diarrhœa alone in fourteen places.

Typhoid-fever alone in two places.

Diarrhœa and typhoid-fever in three places.

Neither diarrhœa nor typhoid fever in four places.

Of thirteen places in which there were public sewers, there was diarrhœa alone in one place.

Typhoid-fever alone in one place.

Diarrhœa and typhoid-fever in seven places.

Neither diarrhœa nor typhoid-fever in four places.

These figures mean practically nothing, and from them practical deductions cannot be made.

In addition the following facts were obtained :

1. In Little Falls, where the sewers are new and privies abound, there has not been an unusual amount of either typhoid-fever or diarrhœa. Almost every case of typhoid-fever was imported from Albany or Schenectady. The drinking water is obtained from springs.

2. One case of typhoid-fever is reported from Gloversville as caused by an untrapped sewer emptying into a creek.

3. One case of typhoid-fever out of seven in Greenwich was due to a country drain.

4. Dr. Willard, of Catskill, reports "one case of typhoid-fever in a family in which a broken sewer was found under the house."

5. Dr. Nellis reports two cases of typhoid-fever as due to sewer gas.

6. Dr. Burton, of Troy, "has found that whenever the streets of that city are torn up to relay broken sewers, along the line of such sewers much typhoid-fever always prevails."

7. Dr. Hennessey reports *two* cases in which defective drains were apparently the cause, while, on the other hand, he also reports *five* cases in houses in which there were no sewer connections at all.

From this information it is reasonable to infer that some of the cases, at least in the epidemic we are considering, were due, directly or indirectly, to sewer gas. I do not know that attention has ever been drawn to one strong argument against the theory of sewer gas as a prime factor in the causation of

the epidemic. It has been abundantly substantiated that wherever there is a broken drain or improperly trapped or ventilated, or in any way defective system of plumbing, there there will be found a vitiated and poisonous atmosphere. Any human being inhaling such contaminated air will suffer in greater or lesser degree from its debilitating influence, and a proportion of these will be in such a non-resistant condition as to readily acquire any of the specific diseases, from whatever source derived, when brought within the range of their influence. I believe, in view of the strong evidence which follows, pointing to the drinking water as the great causative factor, that this is the best explanation of the fact that in so many houses in which typhoid-fever has been found, the inspectors of our board of health have discovered incompetent drainage systems.

IV.—WATER.

The facts obtained in relation to water supply are of vastly more importance. There were fifty-nine returns in all, which can be fairly classified as follows :

1. Wherever spring or lake water was used exclusively (ten places in all), irrespective of sewerage system or drainage and irrespective of atmospheric conditions of the most diverse kinds, in every one of such places there was neither diarrhœal disease nor typhoid-fever.

2. Wherever the water supply was derived from wells, there there was found either diarrhœa or typhoid-fever or both.

3. Wherever river water was used from head waters, or only slightly contaminated as shown by chemical tests, there there was neither diarrhœa nor typhoid-fever.

4. Wherever there were centres of population placed near together, using river water contaminated largely with sewage from places above, there there was both diarrhœa and typhoid-fever.

Three other factors in the water problem were also developed from this investigation.

1. That rivers, and particularly wells, filled with the water that had been washed from the surface after abundant rain, the soil being so thoroughly frozen as to prevent absorption, were most active agents in causing an irritative diarrhœa.

This diarrhœa was of the ordinary character and was not of that severe, chronic and rebellious nature which distinguished the Schenectady type. The water contaminated with the decomposing animal matter of barnyards and fertilized and manured farm lands was a more active agent than water polluted simply with the products of vegetable decomposition. Diarrhœas thus caused made their appearance in January, immediately after the warm weather and heavy rains of that time. Through December the weather was continuously cold enough to prevent thaws. The Schenectady type of diarrhœa began about December 1st, and continued until about the middle of March, and did not seem to be influenced in any marked degree by any atmospheric changes.

2. That the statement that rivers, filled to overflowing after heavy rains and great thaws, contain the germs of disease diluted in a great degree, is found to be fallacious. These rivers do not contain large volumes of water with a proportionately less number of germs, but as shown in 1st, above, are filled with large volumes of water, polluted with a proportionately larger number of germs, washed from the soil.

3. That rivers contaminated with sewage and covered with ice were more dangerous as sources of water supply, through insufficient aeration of the contained water, than when open. Among men engaged as boatmen during the summer and as ice cutters during the winter, and drinking river water at all seasons, it was distinctly observed that such men were free from diarrhœal disease in the summer, but were largely affected in the winter.

IMPORTED CASES.

One other important factor deserves careful but brief consideration before gathering together the facts obtained from the returned circulars. In very many of the places reporting cases of severe diarrhœa and typhoid, there were none, or few, of home origin, but all, or nearly all had been imported from other places. The cases of diarrhœa of home origin were of ordinary and mild type. The cases of diarrhœa from Schenectady, Albany, Cohoes and West Troy were of that severe and angry form which characterized the Schenectady type. *Thirty-six* physicians reported such cases. The figures are decidedly suggestive. There were imported from

1. Albany, *seventeen cases*, with *two* others reporting some (number not stated).
2. Schenectady, *forty-four cases*, with *seven* others reporting some (number not stated).
3. West Troy, *three cases*.
4. Cohoes, *three cases*.
5. Hudson, *one case*.

In addition, cases were reported,

1. Among railroad men using water at Albany, Schenectady, or Cohoes.
2. Among broom-makers, using river water at Schenectady.
3. Among men engaged in ice cutting on the Hudson River in the neighborhood of the Abbey and Van Wie's Point, both places being situated on the Hudson River just below Albany. Three physicians in three different places observed such cases. These men drank Hudson River water. At least forty per cent of the men cutting ice and drinking the river water at Van Wie's Point had either typhoid-fever or severe diarrhœa. The greater number had diarrhœa of the Schenectady type.

From *all other places* only *nine* cases were reported as imported. At least one hundred cases, of which sixty-seven are actually known and the rest conservatively estimated, were from Schenectady, Albany, West Troy or Cohoes. Considering the entire number of returns, this is a very large number, and there is something very suggestive in these figures.

THE FOUNTAIN AND ORIGIN OF THE EPIDEMIC.

It has been suggested that Schenectady was the fountain and origin of the epidemic under consideration, and that the pollution of the waters of the Mohawk River, by the sewage of that city, acting with other contributory causes, was the source of the epidemic diseases prevalent in Cohoes, West Troy and Albany during the past winter. There are very many facts which point to the truth of this suggestion.

Along the Mohawk River, Rome, Utica, Little Falls, Fonda, and Amsterdam now use spring water almost exclusively as a source of public supply, except the city of Rome, which derives its supply from the head waters of the Mohawk, where pollution is not likely. In all these places there has not been even the usual amount of diarrhœa and typhoid-fever. At

Utica, Little Falls, and Amsterdam, the sewage empties into the Mohawk River. At Rome and Fonda the drainage is the surface and cesspool system. Sewer gas and defective drainage has certainly not caused either of the prevailing epidemic diseases in these places.

From Amsterdam, the city next above Schenectady, there could have been no pollution, as there have been but few cases of the epidemic diseases which have afflicted the lower cities. Moreover, a flow of seventeen miles would be amply sufficient to purify the waters of the very slight sewage contamination through aeration, oxidation and precipitation. In fact, chemical analysis of the Mohawk River water, just above the city of Schenectady, has shown that it is comparatively free from chlorides and albumenoid ammonia.

In this connection, an instructive lesson is taught by the history of the water supply of the city of Amsterdam, kindly furnished me by Dr. Charles Stover. The sewerage has not been of the best until recently. The surface water has collected in places, owing to the inequalities of the roads and inefficient grades, and the sewers have been broken and incompetent. There are also some cesspools. In spite, however, of the sewage system, the waves of contagious disease, particularly typhoid-fever, have risen and fallen with the changes in the water supply. During the use of water derived from the old water system, there were only a small number of cases of typhoid-fever; but there were some. The water so supplied was derived from a water-shed, and flowed along a natural creek, through pasture and farm lands. This water was analyzed by Dr. Tucker and found to be polluted by animal matter, though not to a great extent. This water was not very pleasing to the eye, but, during its use, only a moderate amount of fever prevailed. In 1890 the reservoirs failed, and the water commission shut off the supply from that source. Old wells, known to be contaminated, were now resorted to, when there was an immediate and alarming increase in the number of cases of typhoid-fever, amounting to an epidemic. Soon after water from a new source became available, and its introduction was followed by a steady and marked decrease in the number of new cases until this fever became infrequent and, practically, disappeared. This new source is from springs

supplied by the gravity system, in addition to which there is also a supply from a lake near Ballston Spa. This is a fairly conclusive history of typhoid-fever due to contaminated water, the sewage system remaining practically the same during the entire time.

The Mohawk River towns, as far as Schenectady, were thus found to be free from the epidemic diseases we are considering. The Hudson River towns from the north, as far as West Troy, now demand attention.

Sandy Hill, Fort Edward, Lansingburg, Waterford, Green Island, and Troy have been free from the prevailing epidemic diseases.

Fort Edward and Sandy Hill are supplied with water from springs. In both places the drainage is by means of the surface system. In neither has there been unusual diarrhœa or typhoid, except four cases which were imported to Sandy Hill and one to Fort Edward.

Green Island (which is subject to the same atmospheric conditions as West Troy, lies contiguous to it, and is drained by the surface and cesspool system) has also been free from prevailing diseases. This town derives its water from a basin on an island in the Hudson, after percolation, which practically excludes contamination.

Waterford and Lansingburg, just above the city of Troy, have been also free from epidemic typhoid-fever and diarrhœa.

The sanitary condition of the city of Troy is well known, and needs only suggesting in this place. The water supply is from the Hudson, immediately above the State dam. The sewers are of all conditions and kinds, while the house drainage is of the many degrees of perfection or imperfection found in modern American cities. The atmospheric conditions are, practically, the same as those existing in West Troy, directly across the river, and in Albany, six miles below. The Hudson, with overflowing banks, has furnished, part of the time at least, the same mechanical conditions for the forcing of sewer gas into the houses as found at Albany. Yet, with the exception of imported cases, there has been, practically, neither diarrhœal disease nor typhoid-fever in that city.

The chain of cities and towns beginning at Schenectady and ending at Catskill present a suggestive history.

The city of Schenectady, in which endemic typhoid-fever has prevailed for years, takes its water supply from the Mohawk River, immediately below the entrance of a tributary creek known as the Beinekill, the intake being situated just in front of the upper end of the city. This source of supply is used by only a portion of the inhabitants. A very large number of houses having no connection with the water mains are still supplied by the old wells, which are fearfully contaminated with sewage, and are in near relation to the privies. The soil surrounding these old wells is thoroughly saturated with decomposing animal waste.

The systems of drainage are four in number :

1. The "Memphis" system of sewers, running through all the principal streets, and discharging their contents into the Mohawk, below the water-works' intake. Only part of the houses, however, along the line of these sewers, drain into them. The system is flushed automatically at intervals during the day, and, as far as it is utilized, contributes largely to the public health. All evidence seems to point to the completeness and thoroughness of part of the system. Part of the system, however, unfortunately is incomplete, owing to irregularities in the grades, thereby allowing the sewage to accumulate in places. In other places the sewers are reported to be broken. Houses draining into these sewers are relatively free from typhoid-fever, though not from diarrhœa.

2. The cesspool and surface systems, largely used in portions of the city, a source of pollution of the wells, and, together with the old privies, a constant menace to public health.

3. The sewage system of the Edison and Westinghouse companies, which is common to the two works, is complete and thorough in itself, but discharges its sewage into Beinekill Creek, above described as a tributary of the Mohawk, at a distance of half a mile above the intake of the Schenectady water-works. This sewer, together with Cow Horn Creek, presently to be described, is a direct and absolutely certain source of contamination of the Schenectady drinking water. It appears to me to be morally certain that it is just here that the source of the epidemic of last winter is to be found.

It is only just and fair to say that the Edison Company is

entirely free from responsibility for directly or indirectly contributing to the large amount of sickness among its employés. Through the kindness of Mr. Kreusi, superintendent of the works, I was permitted to inspect all the buildings of the company, and to study their sewage system. Of the thirty-six buildings, comprising the works at that time, only four have any relation to the drainage system. All their closets, except in the four buildings just mentioned, are outside the main buildings, and there are no sewer pipes running through or under any of them. These closets are trapped and ventilated, and flushed at regular intervals. The four buildings in which closets were found were those used by their female employés. Each of these closets is flushed automatically whenever used, and their waste pipes are trapped and ventilated. The sickness among their employés seemed proportionally large, but, when it is remembered that from a third to a half of the working population of Schenectady are employed in these works, it is evident that the relative sickness was not larger among them than among Schenectady people of the same class employed in other places. Early in the epidemic, the Edisons, from necessity, supplied the same water to their employés as that supplied to the people of the city generally. This water was from the city water supply, drawn from the Mohawk, was dirty, of bad odor, positively contaminated with sewage, and was the certain cause of the severe diarrhœal disease among their men. Now these men are supplied with clear and comparatively pure water from a system of driven wells. The Edison Company has done its full duty to its men and to the public, and should be free from all responsibility.

4. The fourth system of sewage is the most dangerous of all. Running through the centre of the city, starting from the cemetery at Nott Terrace, in the western portion, is Cow Horn Creek, which empties itself finally into the Beinekill, at a distance of only a quarter of a mile above the water-works' intake. Its course is winding ; it is not covered in any way ; and into it flows the sewage of perhaps a twelfth of all the houses in Schenectady ; its water is contaminated and foul, shown to be charged with chlorides and albumenoid ammonia by chemical tests, and finds its way along the quarter-mile

flow into the Mohawk, almost directly above the Schenectady water-works' intake. It needs neither bacteriology nor chemistry here to prove a certain contamination.

It is not possible for me to lay all the evidence before you within the limits of this paper. But whoever goes over the ground with ordinary care will, I think, find the statement of Dr. Duryee, of Schenectady, to be true; that the Mohawk River water, polluted as above described, has been the cause of most of the diarrhœas, while the old wells have been the cause of most of the typhoid-fever. It is not to the discredit of Schenectady to make these statements now, as its people are actively seeking reform in sanitary affairs.

Out of 85 cases of typhoid-fever in Schenectady, in 84 well water was used. Among the Edison employés, who drank the river water, diarrhœas were almost universal, irrespective of other conditions. Among five cases of the Edison employés who left Schenectady suffering from profuse diarrhœas and who recovered, *four*, on returning to work, drank only water from the exhaust and remained well; while the *fifth*, who also returned, but drank of the Mohawk water again, was again afflicted with severe diarrhœa. This is fairly conclusive evidence. It has been also reported that in some of the houses having the most approved system of drainage, but using river water, many cases of diarrhœa occurred. Most of the cases of typhoid occurred in houses with no sewer or water connections, and in which well water was used.

As a still further proof of the firm conviction among all those who speak honestly upon the subject after a careful investigation, the following extract from the report of the water commissioners on the new or Van Slyke Island supply is offered.

"In view of the experience of the past few years, it would seem to be a work of supererogation to set forth the necessity of a change in the city's water supply.

"Whether it is considered as a muddy liquid, unfit for drinking, washing, or culinary purposes, filling up the mains and service pipes with sediment and lessening their capacity, or whether it is considered in its sometimes tolerably clear and far more dangerous condition, contaminated to a greater or less degree by the sewage which is emptied into the Frog

Alley River *—a constant menace to health, an injury to the prosperity of the city through the impression which has gone abroad and is steadily gaining ground of the unhealthfulness of the city (and which impression will not be removed by mere denial) from whatever point of view it is regarded, the necessity of a radical and immediate change is generally conceded."

Diarrhœal disease and typhoid-fever became epidemic in Schenectady about December 1st, and numerous cases appeared in Cohoes, West Troy, and Albany a week or two later. It would seem probable from this sequence of time, together with the other evidence, that the river water, contaminated at Schenectady, reached the lower centres of population, and after the usual period of incubation made itself felt.

The sanitary condition of Cohoes, so far as it relates to the subject under consideration, is briefly told as follows: The water supply of Cohoes is obtained from the Mohawk River in the neighborhood of Crescent, two miles above the city, and is furnished to the public through two reservoirs, known respectively as Nos. 1 and 3. The water from reservoir No. 1 was examined by Dr. Tucker on February 26th, 1891, and found to be contaminated. The water from reservoir No. 3 was also examined by the same analyst at the same time and found to be in such condition as to be positively unfit for use. As frequently happens when water is stored in reservoirs, in addition to any primary contamination, secondary pollutions from vegetable growths in the reservoirs themselves may occur. This happened in reservoir No. 3 in Cohoes. In addition to the original contamination of the Mohawk River water, still greater pollution occurred after this water had remained for a little time only in this reservoir. Clinically, also, it was observed that the portion of the city supplied from reservoir No. 3 was much more numerous affected with prevailing epidemic diseases than the portion supplied from reservoir No. 1.

The sewers of the city of Cohoes are ventilated and empty into the Mohawk below the falls. Their mouths are exposed, except at high water. Some of the houses in which cases of

* Frog Alley River is another name for Cow Horn Creek, before described.

fever and diarrhœa occurred have no sewer connections. Others are known to be well plumbed, trapped, and ventilated. Of fifty-eight patients reported by Dr. Featherstonhaugh, fifty-seven drank unboiled water and the other drank boiled water. These cases following are of interest : (1) " Mr. J., of Cohoes, uses boiled water. There are three young people in his house. One of these goes to school at Albany, drinks the water, and promptly has typhoid. The others escape." (2) " At Northside, a suburb of Waterford, where there have been no cases of home origin, two imported cases occurred there : one, a boy, goes to school in Albany, and the other, a schoolteacher, lives in Waterford but teaches in Cohoes. Both drink river water. Both have fever, their families escaping." Dr. Featherstonhaugh, who communicated the above facts, kindly furnished them during a very busy season, and states that he could give more examples if he had the time.

The facts from West Troy bearing upon this matter are few in number, but most decidedly to the point. West Troy has a double water supply—the Hudson above Troy, and the Mohawk at Dunsback Ferry. After the first fifty cases of typhoid-fever had been reported, the Board of Health ordered the Mohawk River water to be shut off ; within thirty days the disease almost entirely disappeared. The superintendent of the water-works, at the end of that time, surreptitiously turned the Mohawk water on again. There followed a prompt and widespread reappearance of the disease. Ninety-five per cent of all cases in West Troy, as reported by Dr. Van Vranken, used river water, and occurred irrespective of drainage of any kind. There are some sewers in West Troy, some cesspools, and some surface drainage ; the sewers empty into the Hudson.

The factors of the problem in Albany are well known, so far as local conditions are concerned. Albany has two sources of water supply—one from the Hudson, furnishing river water to all that portion of the city west of North Pearl Street, and a second supply from Tivoli Lake, the water flowing into which is collected through Patroon's Creek. Arising from springs, Patroon Creek is augmented as it flows through farm lands, by a water-shed. Almost all the cases of typhoid-fever in Albany

were found in the section of the city west of Pearl Street using river water. The section east of Pearl Street, using the Tivoli Lake supply, was comparatively free from the disease. Out of 406 cases of typhoid and symptomatic fevers occurring during this epidemic, as reported by the health officer of Albany, 334 used unboiled and unfiltered river water, while 72 used either boiled or filtered water. About eighty per cent of the cases used unboiled or unfiltered river water. Of the returns from Albany, all but three expressed themselves as believing the river water to be the chief cause. Of the three who expressed themselves otherwise, one said he had no opinion on the subject; one said water is positively not the cause; and one said, frankly, he "didn't know." Two other statements were made in this connection: "St. Agnes's school, where plumbing and drainage is perfect, and where the water has been boiled with great care (so that both the drinking water and sewer gas can be excluded as a cause), there were a very great many cases of diarrhœa, but there has not been a single case of typhoid-fever. On the other hand, in the Albany Orphan Asylum, where the water was not boiled, there has been neither diarrhœa nor a single case of typhoid."

The diseases under consideration did not appear in epidemic form in Hudson, Coxsackie, or Catskill. These places are all situated on the Hudson River. There is a flow of about twenty miles between Albany and Hudson. Catskill is still farther down the river. In Coxsackie river water is not used generally for drinking purposes.

At Hudson, river and well water are used as a source of supply. Drainage is good into sewers emptying into the Hudson River. There were diarrhœas, beginning after the January thaw, but scarcely a case of typhoid-fever.

At Coxsackie, where cistern and well waters are used, there was neither unusual diarrhœa nor typhoid-fever, except among the ice cutters drinking river water.

At Catskill river water is mostly used, with some cistern and well water. Drainage is by means of public sewers in part, and in part by means of the surface system. There have been many diarrhœas following sudden changes in temperature, but no typhoid-fever.

From the foregoing statements of facts, together with other

facts, for the presentation of which there has not been time in this paper, all largely contributed through the kindness of the profession, I am led to the following conclusions. Excluding from consideration the abdominal type of la grippe and the diarrhœas caused by bad food and sudden changes in temperature, I believe the epidemic diseases prevalent during the past winter to have been due—

1. To the following contributing causes :

(a) An ice-bound condition of the Mohawk and Hudson rivers, whereby contaminated water was not sufficiently aerated, and the destruction of such contamination by oxidation was prevented.

(b) Additional contamination occurring after thaws and rains, the earth being frozen and preventing absorption, and the surface accumulations of decomposing animal and vegetable materials being washed directly into rivers and wells.

(c) Non-acclimated persons drinking for the first time water to which they had not been accustomed.

(d) Polluted milk supply. I am informed that a number of cases of typhoid-fever, in Albany, occurred among people using milk obtained from the same milkman.

(e) Sewer gas acting as a debilitating agent, and, in occasional instances, as a direct cause.

2. And to the following as a chief cause :

(a) Typhoid-fever and diarrhœas endemic in Schenectady, caused by the use of either the polluted city water or private wells, or both.

(b) The water of the Mohawk contaminated by the city sewers of Schenectady, polluting the water supply of the city of Cohoes at the intake at Crescent above the Cohoes Falls.

(c) The water of the Mohawk again contaminated by the city sewers of Cohoes below the falls and polluting the drinking water of both West Troy and Albany.

If I had any bias at all at the beginning of this investigation, it was in favor of the river water as a proper and healthful source of public supply. It is to me at least a most convincing argument that the above conclusions were forced upon me by the powerful logic of the facts obtained.

REQUISITE QUALIFICATIONS FOR SANITARY SERVICE.

UNDER the caption of "Practical Instructions for Public Health Diplomas," the *British Medical Journal* has recently published the following, which the various boards of medical and civil service examiners, State and municipal boards of health, and others responsible for the slipshod sanitary service in the United States, would do well to profit by.

Sixteen different examining bodies in the United Kingdom have formulated regulations for examinations in public health. Naturally enough, there is considerable variation in the standards and range of subjects required, and still more in the manner in which they are specified. The recent resolutions of the General Medical Council—making laboratory training and practical sanitary work imperative upon candidates—have led to further modifications in the synopses issued by the examining boards; as the Education Committee of the Council have pointed out, "there is difficulty in understanding what the whole of the regulations under which some of the authorities grant the diploma in Public Health really are."

The difficulty is one with which the teaching bodies and intending candidates for these diplomas are only too well acquainted, although perhaps inevitable in a period of transition like the present. The clear and well-timed report of the Education Committee will enable the respective examining boards, with or without pressure from the General Medical Council, to bring their regulations into more explicit form, and to ensure the high standard of efficiency which the Council prescribes.

The laboratory work required should comprise the study of air, water, food, clothing, soil, sewage; meteorology, bacteriology, disinfection, parasites, and certain branches of human and comparative pathology. The Committee suggested that use might be made of the resources of the veterinary school, and that candidates should be required to produce

evidence of having received practical instruction in diseases of animals in relation to public health.

The course of laboratory instruction must cover a period of six months after the candidate has obtained a registrable qualification, in a laboratory or laboratories approved by the examining body. Several efficient laboratories are now being organized, and it is important that the other authorities should clearly define in detail, as the Conjoint Examining Board in London have already done, the points upon which practical instruction is required.

The Committee offer no suggestions with reference to the six months' course of practical out-door sanitary work with the medical officer of health for a county or large urban district, which is to be required in the new order of things. Facilities for this purpose have already been given in Newcastle and elsewhere, but it would be interesting to know how far the new system of pupilage has been accepted by medical officers of health generally, and by their sanitary authorities.

Both courses of practical work must be taken in a post-graduate year, and at least twelve months must elapse after obtaining the first registrable qualification before a candidate is admitted to the examination for a diploma in public health, the object being "to secure the attention of candidates to the higher special studies, undistracted by the ordinary work of the medical curriculum."

The Medical Council has taken strong action to ensure that the next generation of medical officers of health shall be scientific men, well trained in the theory and practice of this special branch of medicine. Let us hope that the sanitary authorities of the future will also advance with the age, and that a true national public health service worthy of the country may at last be formed, with a Minister of Health at its head.

AN UNSOLICITED COMPLIMENT.—Dr. Binks (the family physician): "I'm afraid your wife is in a very serious condition, Mr. Tangle."

Tangle: "That's just what I've thought for some time, Dr. Binks, and I've been telling her all along that she ought to have a better doctor."—*Munsey's Weekly*.

MEDICAL OFFICERS OF PASSENGER STEAMSHIPS.

ONE of the trials of the Health Officer of this port, and probably of those at other ports as well, though to a less degree, is the trouble and the vexation caused by the utter incompetence of many of the surgeons supposed to look after the health of the passengers and crew of the vessels on which they sail. In his previous reports Dr. Smith, the Health Officer at New York, has protested against this state of things, and urged the necessity of devising some way by which it may be possible to secure competent men for these responsible positions, and in his report for this year he again devotes several pages to the subject.

In spite of what has been said by many conversant with the existing evils of the medical service on the passenger steamships coming from Europe to this city, it is reported that there has been no material change for the better, and that there is not likely to be until the companies awake to the fact that it is to their own interest to obtain good men for this service by the only way in which this is possible—namely, by paying their doctors a salary that will compensate them and will attract experienced and intelligent men, who will take up the work for life, and not merely as a little vacation after student days, and with a desire to see something of the world before settling down to the routine work of medical practice. The fact that the surgeons on the first-class transatlantic steamers are generally good men is evidence sufficient that the payment of a fair salary would bring men of ability into the service, since on these boats the contributions of the passengers add sufficiently to the miserable salary paid by the company to make the position a desirable one, and to attract physicians of some standing in their profession. But even here, as Dr. Leet, of Liverpool, has so often declared and proved, it will be impossible to get men who will act solely for the good of those entrusted to their professional care, when possibly the health and well-being of these people can

be secured only at some pecuniary sacrifice on the part of the company, or it may be at the expense of the captain's comfort, until the surgeon is made in a measure independent of the company for his position. "The medical service on transatlantic passenger steamers will never be what it should and can be," says Dr. Smith, "until the medical officer has a status in the mercantile marine which he has reached by due preparation and examination by a competent board, and which will be as secure and permanent, when he has obtained it, as that of the medical officers in the English Navy, or the United States Marine Hospital service."

It would at first seem a rather hopeless task to induce these companies, whose margin of profit is none too great, to increase their expenses sufficiently to enable them to offer a compensation that will tempt competent men to accept service under them in their ships. But it might be found cheaper in the end, if by so doing the occasional detentions at Quarantine, necessitated by blunders on the part of the ship's surgeon, could thereby be done away with. In one case a passenger who had been suffering from small-pox for four or five days was found by the deputy health officer on making his inspection at Quarantine. This case had not been seen, or at least not recognized, by the ship's doctor. The passengers were removed to the Quarantine of Observation and detained fourteen days, at an expense to the company of about four thousand dollars. This sum, added to the amount now paid to the medical officers of that line, would have made each one's salary nearly decent, and there would have been some inducement to educated and competent men to enter the employ of the company.

The gross stupidity of some of the surgeons to whom are entrusted the lives of travellers to and from England and the Continent is most astonishing. An instance illustrating this, which occurred on an English steamer arriving at Quarantine with six hundred immigrants, one of whom had small-pox, is related by the Health Officer of the port in his report. "The patient was found in a sort of box seven or eight feet square, built of rough boards in the centre of one of the steerages. For purposes of ventilation a hand's breadth of space was left on all sides at the bottom of the pen, and some five feet from

the bottom slats were laid horizontally, two or three inches apart, until the sides were built up sufficiently high to prevent the escape of the patient, or the intrusion of friends. When the Health Officer remonstrated with the doctor for this outrageous exposure of the well passengers to the contagion of the sick, he exclaimed, in words and with a manner that seemed intended to settle the matter, "Don't you see, sir, that I have scattered carbolic acid powder all around?" pointing to a patent disinfecting powder that had no effect except to disguise more disagreeable smells, that had been sparingly scattered on the steerage floor in the vicinity of the victim's pen." Another so-called doctor allowed a passenger with semi-confluent small-pox to remain four or five days in the steerage with four hundred and twenty-eight other passengers, apparently not knowing that there was anything wrong with the patient.

But all are not as bad as this; and since we have quoted Dr. Smith in some of his strictures upon the incompetent, we gladly listen to him when he finds something pleasant to say for the efficient among the ship surgeons. "There are," he says, "capable and efficient medical officers on those transatlantic passenger steamers whose patrons are numerous and liberal; to such these criticisms do not apply; and for those they are not intended. There are few more capable physicians than many of the medical officers of the first-class steamers that run between ports of the Old World and the New."—*Medical Record*, August 22d, 1891.

COLLECTIONS FROM DISTILLED SPIRITS in the United States during the fiscal year ending June 30th, 1891, aggregate \$83,335,963, an increase of \$1,648,588 over the preceding year; and from fermented liquors, \$28,565,130, an increase of \$2,556,595. The total quantity of distilled spirits of all kinds produced during the year upon which internal revenue tax was paid was 87,473,798 gallons, an aggregate increase over the previous year of 3,430,462 gallons. Of fermented liquors the production was 30,478,192 barrels, nearly half a barrel for every man, woman, and child in the country, and an increase over the previous year of 2,916,248 barrels.

THE SANITARY AND UNSANITARY RELATIONS OF UNDERGROUND WATERS.*

By S. H. BRYCE, M.D., Toronto, Canada.

IT is not my intention to deal at any length with this subject, but rather to present some of the principles to be observed in the selection of drinking waters.

Much has been said with regard to the dangers of drinking water from wells ; but it has not been until recently that the differentiation has been made as regards wells that are dangerous and those that are healthy.

As a general principle it may be said that practically all *really* underground waters are sanitarily good ; but it must be clearly understood what is meant by an underground water. For instance :

1. A water lying in a shallow dug-out in prairie or bog land, down only to the impervious clay or rock below, cannot fairly be called underground water.

2. Neither can a well down even into a true water-bearing stratum of sand or gravel be called an underground water if the water of the upper organic soil layer is allowed to percolate toward the well laterally, without really moving downward through the underlying beds of clay loam, sand or gravel, which serve to sterilize the waters in their passage downward.

3. Neither can a well be called underground if, as is commonly the case, the well is covered with loose boards or a wooden framework, thereby allowing the filth washings from the surface of the boards to be carried down through cracks into the water of the well.

Carl Fraenkel and others have carefully examined into the water of pit-wells, and such have by Pflügge been called "hygienic monsters."

Clearly, then, underground waters mean those which have primarily fallen upon the surface, have there been contami-

* Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May, 1891.

nated with soil microbes, but which have, in their passage downward, through percolation to the water-bearing zone situated on some impervious stratum, been purified by the several natural agencies which are at work.

Of these, doubtless, the one of greatest importance is the mechanical retention in the upper layers of the grosser organic matters—for instance, those of sewage on a sewage farm.

I have found that at a sewage farm the upper circle or two of the bed of sand has retained practically all suspended organic matters, and that even soluble organic matters are gradually abstracted by capillary adhesion from waters as they pass downward.

In addition, however, to this cleansing action of capillarity, we have at work, under favoring conditions, the destructive action of bacteria. With various kinds of organic matters putrefaction bacteria deal largely, but their work, while purifying to the soil, may result in emanations of an extremely injurious character. In order that this decomposition may go on rapidly and without pernicious results, intermittency of deposit of organic matter on the surface and the penetration of air with its oxygen into the soil is required, in order that the nitrifying germ proper may carry on its beneficent work.

Manifestly, therefore, we have in towns conditions where, with the permanent presence of masses of organic matter in back-yards and in privies, waters may move laterally or from the surface, carrying to the largest extent their solubility admits of organic materials to underground strata, which, appearing in wells, and there coming into contact with oxygen, supply conditions for the free multiplication of germs borne in from the surface or the air, and hence waters that have been sterile as underground streams, and loaded with soluble organic matters, become culture media for certain pathogenic bacteria in those seasons of the year when the water temperature makes their development abundant. Every one is familiar with wells dangerous only in the later summer months, when deep, or from spring or early summer, when their water reaches a higher temperature.

Much interest has for many years attached to the experiments of Pettenkofer with regard to the rising and falling of underground waters, in their bearing upon the increase in the

mortality from filth diseases, notably of typhoid-fever. It has been assumed that he was correct in saying that after a summer lowering of the ground water, and then a rise with autumn rains, typhoid invariably increased.

Now, with regard to this, as with so many other conditions, individual local circumstances will decide whether or not he is correct. For instance, Buck and Franklin have laid special stress on *wetness of soil* in general, and the effect of highness or lowness of the *subsoil water*, as increasing *cholera infantum*. Hirsch, on the other hand, examined the relationship between the number of cases of cholera infantum and the level of the subsoil water at Berlin, from 1877 to 1882, and concluded that the height of the subsoil water in Berlin gives no measure of the rate of mortality. Now if we look closely into the facts there, his conclusions are as we would expect. The city is largely supplied with public water from the river sources, and naturally we find that during periods of high ground water, the rivers become increased in their volume, and instead of the drinking-water being more impure at such times, it would be less so.

But the case is different where well water is used. During the periods of dry weather, as the water in the superficial soil layers has gradually passed downward, it has been followed, according to the permeability of a soil, by atmospheric air, thereby extending the line of organic decomposition downward—this, however, being limited usually by the upper four or five feet.

What then takes place when heavy rains come? The first result is that the upper permeable bed, loaded with bacteria from free decomposition of organic matters, becomes saturated with moisture, while privies also, which have during the dry weather lost most of their fluid contents by evaporation, likewise become surcharged with moisture. The water from both these supersaturated sources moves along laterally downward toward the wells, as the lowest point, and loads them with soluble organic impurities, and with putrefactive and nitrifying bacteria; in addition to suspended impurities washed in from the surface. This causes disease beyond question; but this is not due to the rise of ground water necessarily, since, as all know, the actual rise, in other than shallow subterranean

water-streams and in springs, does not take place till weeks or even months after the spring or autumnal heavy rainfalls.

We therefore can see that the conditions governing the purity of water supplies from ponded streams and small lakes are very different from those governing well waters, as in pit wells. When the first are most foul, the latter are often least so.

The question, then, of the use of underground waters is of a much wider nature than that relating merely to pit-wells in town and country.

Falling upon pervious upper soil and upland and cultivated fields, the rain forms those great reservoirs upon which river and lake supplies, as also that of ordinary wells depends. Springs on the hill-side are the index of their existence, and to these streams must we look for a pure water supply, obtained under conditions widely different from those we have just referred to.

Analyze these spring waters before contaminated by surface filth, drive an iron pipe down to this water-bearing stratum, and we find a water in all cases absolutely free from bacterial life, and those conditions which make pit-wells under ordinary conditions such dangerous sources of supply.

As the rivers in recent years have been falling during the long summer, through the loss of the upland forests which formerly held back the water, and whose absence likewise creates long summer droughts, relieved at most by destructive thunder-storms, we have found ourselves depending upon ponded waters, becoming more impure by evaporation, lessening their amount, or upon rivers becoming more polluted by this lessened amount, together with increasing pollution by our growing towns. We are hence forced to turn our attention to these underground waters, sometimes, it is true, somewhat excessive in hardness, but always sterile, and supplying to artesian wells, driven wells, water-galleries of perforated pipes, and springs carefully collected and protected against surface pollution, while the utilization of such will do much to solve the questions both of water supply and sewage which, upon this rapidly populating continent, are to-day of more importance than probably all other health problems combined. — *Journal American Medical Association.*

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION. SUPPLEMENT. (Continued from page 161.)

By Dr. H. R. STORER, of Newport, R. I.

SECTION XI. *Military and Naval Hygiene.*

(THE SANITARIAN, February, May, July, and August, 1890.)

Dr. E. K. KANE.

(1247.) The large and extremely rare shell that I described, by J. G. Coutts, is now in my collection. It exists also with the following reverse. An eagle with spread wings, holding in its talons a scroll, upon which, Brig Advance, and the legend: *Fidem In Tenebris Servare* Also nineteen additional eagles, with the names, commencing at the right, of Dr. I. I. Hayes, and the other companions of Kane.

Vattemare, *Collection de Monnaies et Médailles offertes a la Bibliothèque Imperiale*, 1861, p. 177, No. 118; Storer, *American Journal of Numismatics*, October, 1890, p. 40.

Mr. Rochereau, of New Orleans.

1853. Obverse. *Souvenir De La Guerre Contre La Prusse | République Français | Souvenir | Généreux | Et Patriotique.*

Reverse. *Le Citoyen | Rochereau | Négociant Français | A La Nouv^{lle} Orléans | Envoie 200,000, F. | Aux Blessés Français | 1871.* Lead, gilt. 29. R. C. Davis Cat., January 22d-26th, 1890, No. 2067.

The query has been raised if the above was Masonic, as it "has the same obverse as the Masonic medals struck to commemorate the acts of the Freemasons during the Commune." Harzfeld Cat., October 25th-26th, 1877, No. 460.

GERMANY.

Dr. Johann August Wilhelm Heden (1760-1836), of Dresden.

1854. Obverse. Bust. Beneath : Krueger F Inscription : J. A. G. Hedenus Per X Lustra Medicus Sagatus Et Togatus. Dresdae D. 16 M. Julii 1833.

Reverse. Æsculapius attending to a wounded soldier. Legend : Ore Docens Artem Dextra Fert Arte Salutem. Exergue : Collegarum Et Amicorum Pietas. Silver, bronze. 40 mm. Kluyskens, ii., p. 23 ; Duisburg, p. 157, ccccxix. In my collection.

Dr. Christopher Horch (1667-1754), of Berlin, Surgeon-in-Chief of the Prussian Army.

1855. Obverse. Bust. Inscription : C.Horch.Consil.Intim.Et Archiat.Bor.Reg.

Reverse. Entwined within a wreath of oak and laurel : Avi Optimi C. V. J. C. V. Moehsen M.D. Also a band, on which : Den.1754. An. Aet.87 Silver, bronze. 53 mm. Rudolphi, p. 77, No. 323 ; Kluyskens, ii., p. 40 ; Duisburg, p. 124, cccxxx.

There exists a third American medal of Schiller.

1856. Obverse. Bust to left, within a laurel wreath.

Reverse. Zur Erinnerung | An Die | * Schiller * | Monument Fair | April 20.-Mai 2. | 1885 | Philadelphia Tin. 18. 29 mm. In the Fisher collection.

Dr. Edward Schnitzler (Emin Pasha).

1857. Obverse. Bust, with spectacles and fez, facing. Inscription : * Emin * - Pascha Exergue : crossed oak branches.

Reverse. Within laurel branches tied by ribbon : Zur Erinnerung | An Die | Erfolge | Emin Pascha's | In Africa Edges beaded. Bronze. 19. 28 mm. In my collection.

1858. Obverse. Military bust, to right. Inscription : Wilhelm II — Deutsch.Kaiser

Reverse. Half bust, with fez, facing and to right. Inscription : Emin Pascha (and in Arabic) | Deutsch Africa (and in Arabic). Ifrigijeh Alemania Silver. 30 mm. Weyl, *Num. Corr.*, 1890, No. 91-93, p. 7, No. 132.

AUSTRIA.

Dr. Fr. Anton Brendel, Military Surgeon.

1859. Obverse. Laureated head. Beneath, J.Nep.Wirt. Inscription : Josephus II Augustus.

Reverse. Bene Merentibus De Arte Med.Chirurg. Præmium Instituit Fr.Anton Brendel Chirurg.Milit.1785. Széchény, Cat. numorum Hungariæ, etc., 1807, i., p. 446; Duisburg, p. 134, ccclix., 1.

1860. Obverse as preceding.

Reverse. Bene Merentibus De Arte Medico-Chirurgica Præmium. *Ibid.*, ccclix., 2.

Among military hospitals should be included that at Warmbrunn, in Prussian Silesia, No. 275.

There exists the following American national medal.

1861. A five-pointed star, bearing caduceus, laurel wreath, shield, fasces and sword. In centre, M S. Inscription: Authorized By Order Of Surgeon-General U. S. A.

Silver, with gold and enamel, and gold centre. 51 x 21. Heavy ribbon, and pin with eagle. Woodward, Fifty-second Cat., December 11th-12th, 1882, No. 1164.

The above specimen was inscribed: Brevet Major W. J. McDermott, and C. H. Crane, Surg., U. S. A. Oct., 1865.

Among French ambulance medals reference should be made to that of Rochereau, of New Orleans, already described, No. 1853.

To those of Germany are to be added the following:

1862. Obverse. The Geneva Cross. Inscription: Bayr. Frauenverein Pfalz. Exergue: a star.

Reverse. Spar (Savings) | Marke | —.— | L. Edges milled. Brass. 13. In my collection.

1863. Obverse. Hygeia surrounded by children. (Ladies' Section of the Red Cross, Hamburg, 1889.)

Reverse. The cross and inscription. Silver. 27. Frosard, One Hundred and Fifth Cat., March 7th, 1891, No. 73.

1864. Obverse. Bust, to left. Inscription: Carola Kronprinzessin Von Sachsen. Upon neck: M B

Reverse. The Red Cross, within perpendicular lines. Inscription: Ev.Math:Cap.25:V:40. Edges lined. Silver. 13. Only seventy struck. In my collection.

AUSTRIA.

1865. Obverse. A vehicle, at full speed. Inscription: x Für Das Fiaker Caroussellfahren 18 Juni 1887 x Von Grafen Wilczek

Reverse. Female head, in hexagonal star. Below : waves. Above : flames. Inscription : Für Die Wiener Freiwillige Rettungs Gesellschaft. Silver. In my collection.

The following English pieces may be appended.

1866. Obverse. A man with wooden leg. Mr. Joseph Askins. The Celebrated Ventriloquist. 1796. Conder, *loc. cit.*, p. 210, No. 4 ; Battey, i., p. 83, No. 8^B, p. 390, Nos. 3954-57.

The above is a token of Aylesbury, Buckinghamshire.

1867. Obverse. A sailor with a wooden leg. Tom Tackle. *Ibid.*, i., p. 494, Nos. 4875-76.

In connection with naval hospitals there might have been mentioned the following, under France :

1868. Obverse. Bust of Louis XV., to right.

Reverse. A statue upon a naval monument. Inscription : Invalides De La Marine, 1773. Silver. Octagonal. 22. Frossard, One Hundred and Sixth Cat., May 6th-8th, 1891, No. 912.

SECTION XII. *Climate.*

(THE SANITARIAN, September, 1890.)

There is an additional medal of Alexander von Humboldt.

1869. Obverse. Head, to right. Inscription : Alexander V. Humboldt | +Geb.D.14 Sept.1769 Gest.D.6 Mai 1859+

Reverse. Between laurel branches tied by ribbon : Zur | Secularfeier | D.14.Sept. | 1869 White metal. 23. In my collection.

The much-discussed Avalonia token of Glastonbury, England, would come legitimately here, with its legend : ΑΡΙΕΤΟΝ ΜΗΝ ΑΗΡ, if the theory attributing it to Newfoundland, so warmly advocated by Very Rev. Dr. Howley, Prefect Apostolic of St. George's, were only correct. In that case the serpent encircling the branches at base of the harp might well be that of Æsculapius.

Battey, i., p. 30, No. 365, pl. II.; Howley, "Ecclesiastical History of Newfoundland," 1888, p. 87, fig.; Harvey, *St. John's Evening Mercury*, January 14th, 1888 ; *American Journal of Numismatics*, etc.

SECTION XIII. *Registration.*

(THE SANITARIAN, September, 1890.)

1870. Obverse. Dundee Statistical Penny.

Reverse. Adam and Eve. Exergue: Be Faithfull and Multiply. Battey, i., p. 60, No. 851.

SECTION XIV. *Life Insurance.*

(THE SANITARIAN, September, 1890.)

Abraham De Moivre (1667-1754), of London. "Annuities on Lives," 1724.

1871. Obverse. Bust, to right. Beneath: J. A. Dassier. Inscription: Abrahama-mus De Moivre.

Reverse. Within a cartouche: Utriusque | Societatis Regalis | Lond. Et Berol. | Sodalis. | M.DCCXLI. Bronze. 51 mm. Gaetani, *loc. cit.*, ii., p. 363, pl. CLXXXVIII., fig. 5; Snelling, pl. XXXI., No. 5; Rudolphi, p. 109, No. 454; Kluyskens, ii., p. 225; Duisburg, p. 221, dlxxxv.; Hawkins, Franks and Grueber, ii., p. 565, No. 197.

There are several tokens to be added.

1872. Obverse. * Conn.Mut.Life Ins.Co. * | Assets | \$18,000,000 | W. S. Dunham | 194 Broadway | Genl. Agt. | For | New York & N. Jersey.

Reverse. Liberty head, to left. Above: thirteen stars. Exergue: 1868. In the Wright collection.

1873. Obverse. The | Mutual Life | Insurance | Company | Of New York. | Richard A. McCurdy | President

Reverse the same. Tin shell, perforated at centre. 26. In my collection, from Mr. P. B. Murphy, of Quebec.

1874. Obverse. A scroll, with space blank for number. Above: No. Below: an ornament. Inscription: * Accident * | Certificate.

Reverse. Within crossed laurel branches: N.B.A. Inscription: * National Benefit Association * | Indianapolis, Ind. Edges dentated. Nickel. 17. In my collection.

1875. Obverse. Mutual Life | Insurance Co. | Widows and Orphan Fund.

Reverse. Principal Office | issues | every kind | of | life policy | Nashville | Tenn. Rubber. 20. In the Wright collection.

SECTION XV. *Hospitals.*

(THE SANITARIAN, October, 1890.)

An additional instance of the original signification of hospitals is furnished by one of the medals of John Law, of Lauriston.

1876. Reverse. *Dimanche, Nous Vidons (etc., etc.) Et Samedi (Nous Allons) A l'Hôpital (To the Poorhouse).* Cochran-Patrick, p. 131; Hawkins, Franks and Grueber, ii., p. 449, No. 55.

With the medals of quarantine hospitals may be included that of the chief of the Dantzic Hospital.

1877. Obverse. Golden wedding of Ægidius Glaugau. 1734. Inscription.

Reverse. The pair at the altar. P. P. Werner. Silver. Hess Cat., May 25th, 1891, Nos. 1488-89.

With the medals of foundling hospitals :

1878. Obverse. *Asili Infantili | Di | Napoli |* Below : crossed branches of olive.

Reverse. Within laurel branches, tied by ribbon : *Ricordo* | 1888 Brass, silvered. 16. In my collection.

With those of hospitals for the blind :

BRAZIL.

1879. Obverse. Crossed laurel boughs, upon which a closed book surmounted by an open one. Inscription : * Imp. Instit * | *Dos Meninos Cecos*

Reverse. Inscription : *Aº Applicac, Âo | 1º Anno | —o—* Bronze. 27 mm. Meili, *loc. cit.*, p. 23, No. 221, pl. XXXVI.

Similar medals, with merely a change of the numeral, are given for the best student during the seven subsequent years, and another for best conduct.

1880. Obverse. Similar to preceding.

Reverse. Within laurel branches, a harp, etc. Above, a radiant star. Inscription : *Ao Melhor Talento | —.— | Em Muzica | —o—* Bronze. 27 mm. *Ibid.*, p. 23, No. 222, pl. XXXVI.

SCOTLAND.

1881. Obverse. Within circle, view of building. Below, vignette of d^e Inscription : Royal Blind Asylum & School. | Edinburgh.

Reverse. (Name of recipient.) Silver. 45 mm. Cochran-Patrick, *loc. cit.*, p. 139, No. 16*, pl. XXX., fig. 7.

FRANCE.

1882-1891. I have from Mr. A. de Witte, of Brussels, impressions of no less than nine jetons of L'Ecole des aveugles Braille (Louis Braille, of Paris, himself sightless, was a very distinguished teacher of the blind). These jetons are of several shapes, and have upon obverse : Ecole Braille, and upon reverse the following numerals, 1, 2, 3, 4, 5, 10, 20. Tin.

With hospitals for deaf mutes there are

BRAZIL.

1892. Obverse. A hovering dove. Inscription : Fons Sapientiæ | Studii Præmium.

Reverse. A pen lying obliquely across an open book, upon which : Petrus | II — Braz. | Imp. Inscription : Instituto Dos Surdos E Mudos Do Brazil. Gold, silver, bronze. 25 mm. Meili, *loc. cit.*, p. 23, No. 220, pl. XXXVI.

ITALY.

1893. Obverse. Head of Padre Ottavio Giovanni Assarotti (1753-1839), Director of the Asylum for Deaf Mutes at Sienna.

Reverse. Inscription. 1842. By Febris. Bronze. 49 mm. Hess Cat., May 25th, 1891, No. 1443.

With general hospitals there are :

THE UNITED STATES.

1894. Obverse. View of hospital. Inscription : Training School For Nurses. Exergue : Boston | City Hospital | 1864. Beneath, embossed, a portion of a laurel wreath. Gold.

CANADA.

1895. Nurses Training School, London, Ontario.

1896. D^o D^o, Montreal.

BRAZIL.

In addition to the medal already given, No. 1572, of the New Hospital of the Santa Casa, at Rio de Janeiro, there are two others.

1897. Similar in all respects to No. 1572, upon laying the corner-stone of the hospital, save that beneath the bust upon obverse there is Azeredo G. Silver, copper. 33. 51 mm. Meili, *loc. cit.*, p. 11, No. 94^a, pl. XVII.

1898. Obverse. Charity, with outstretched arms, spreads her mantle over a group of eight invalids. Exergue : a mitre and cross, with the national and city shields, upon branches of laurel and flowers, bound by ribbon, which is transfixed by three upright arrows.

Reverse. Within branches of laurel and flowers, bound by ribbon : Ao | Benemerito Irmão | Da Santa Casa | Da Misericórdia | Do Rio De Janeiro | Militão Maximo | De Sousa | Barão De Andarahy | — | 1878 Bronze. 73 mm. *Ibid.*, p. 21, No. 206, pl. XXXIV.

ENGLAND.

1899. Obverse. Building (Ridley's Hospital). Exergue : Lancaster.

Reverse. Staff of Æsculapius. Inscription, upon a ribbon, surmounted by four semicircles, at whose junction is a trefoil : Opened Nov. 3d. 1864. White metal. Battey, i., p. 116, No. 559.

1900. Christ's Hospital, Lincoln. (Engraved.) *Ibid.*, i., p. 13, No. 123.

1901. Surgeon's Hall, London. (Skidmore.) *Ibid.*, i., p. 19, No. 214.

In this connection should be mentioned the following :

1902. Obverse. Design, a Maltese Cross. In centre, within a circle, a sick woman in bed, whom a religious sister points to an altar, upon which a cross between two candles. Around, upon four bands : +Lord+ - Evermore - Give. US.

This – Bread (followed by a flourish). In upper arm of the cross, a cock, above which : Watch – And – Pray In right arm, on a zigzag band : The Love Of Christ | Constraineth | US | (followed by a flourish). In lower arm, two crossed keys with bands, on which : Sisterhood | Of S. Peter In left arm, on zigzag band : He Giveth Medicine | To Heal Their | Sickness Bronze. Octagonal. Communicated to me by Mr. L. H. Low.

SCOTLAND.

1903. View of the Royal Infirmary of Edinburgh, on medal of Geo. Drummond (1687–1766), who was six times Lord Provost.

Cochran-Patrick, *Numismatic Chronicle*, xx., p. 257.

GERMANY.

1904. Obverse. View of building.

Reverse. Fecht Club | Bürger—Hospital | * Bitterfeld (Saxony) * Edges beaded. Silver. 16. In my collection.

1905. Obverse. Building, and inscription within wreath. 1841. Opening of the Civic Hospital at Trieste. In my collection.

There are, in addition, the following pieces, discovered since the present Supplement went to the press.

SECTION I.

1906. Moses, with the tablets of the law. Inscription : Moses Du Zegest Nur Fluch u. Dot (etc.) A Lubec double crown (1619–44). Morris Cat., June 16th–17th, 1891, No. 641.

Among the allegorical medals may be included

1907. In·D^{no}(Domino)·Sperans·Non·Infirmabor· (Wolfgang Dietrich von Raitenau, 1587–1612.) Silver. 35 mm. Montenuovo Cat., 1882, No. 2995.

SECTION II.

1908. Obverse. Eagle, upon three arches of an aqueduct.

Reverse. Inauguracion | De La | Nueva Caneria | (etc.) | Mexico. Bronze. 39. Fischer Cat., New York, April, 1891, No. 328.

1909. Inauguration of water works at Cadiz, Spain, 1874. Gil Catalogo, Madrid, 1884, No. 1260.

1910. D°. at Manila, Philippine Islands, 1878. *Ibid.*, No. 1281.

SECTION IV.

Baden, near Vienna.

1911. Obverse. Bust of the emperor Carl VI. Vestner.
Reverse. The basin of the spring. *Primvs Aquas* (etc.)
Silver. 44 mm. Montenuovo Cat., 1882, No. 1434.

Mehadia, Hungary.

1912. Congress of Hungarian naturalists and physicians.
1872. Silver. Thieme, *Numismatische Verkehr*, October, 1890, No. 3007.

SECTION V.—HOLLAND.

1913. Celebration of the draining of the lake of Beemster, 1712. Arms of ten Dutch families. Silver. 61 mm. Schulman Cat., May, 1890, No. 212.

1914. Drainage of lake of Haarlem, 1852. Menger. Bronze. 66 mm. *Ibid.*, No. 712.

The medal of 1853, by Elion, upon the same event, with inscription, *Lacus Harlemensis Sæcula* (etc.), has previously been given.

BELGIUM.

1915. Opening of the canal from Charleroi to Brussels. 1832. Bronze. *Ibid.*, No. 621.

SWEDEN.

1916. Carl XIV Joh. Construction of the Götha canal. Bronze. 50 mm. Thieme, *loc. cit.*, July, 1890, No. 3040^a.

SECTION IX.—HOLLAND.

1917. Death, with scythe. *Nosce Te Ipsum Et Respice Finem*. 1508. Bronze. Schulman Cat., May, 1890, No. 850. Unmentioned by P. and R.

1918. Inundations, 1862. Bust of Willem II. Bronze.
13 mm. *Ibid.*, No. 1272.

The medal of 1861, upon this event, has already been given.

FRANCE.

1919. Artois, 1587. Multa Sunt Mala Impiorum. *Ibid.*,
No. 822. Unmentioned by P. and R.

AUSTRIA.

1920. View of district inundated by the Po. Signum
Fœderis. Guillemard. Silver. 50 mm. Montenuovo Cat.,
1882, No. 2081. Upon erection of a votive church.

SECTION X. *The Plague.*

1921. Obverse. St. Peter Thomas, erect, with a plant in his
hand. San Pedro Tomas Abogado (advocate) Contra La Peste.

Reverse. Within ellipse of pearls, and irradiated, Maria.
Edges foliate. Oval. Bronze. 16x22. Chapman Cat.
(Warner), July 15th-17th, 1891, No. 1121. In my collection.
Unmentioned by P. and R.

1922. The Netherlands. 1598. Army of Mendoza deci-
mated by the pestilence. Bronze. Schulman Cat., May,
1890, No. 877. Unmentioned by P. and R.

1923. Brussels, 1668. Protectis Meo De Cœlo. Bronze.
Ibid., No. 826. Unmentioned by P. and R.

SECTION XI.

1924. Obverse. Bust of the Emperor.

Reverse. The Military Asylum. Par Urbi Fuit (etc.)
Silver. 55 mm. Montenuovo Cat., 1882, No. 1437. Upon
building the Invalidenhaus at Vienna. See Nos. 1371, 1372.

1925. Obverse. Busts of the Emperor and Empress. Be-
neath, M. D(onner)f.

Reverse. Vindicatis | Undique (etc.) Bronze. 50 mm.
Ibid., No. 1824. Upon laying the corner-stone of the above.

1926. Obverse as preceding, but without the initials.

Reverse. Maria | Theresia Augusta | (etc.) Silver. 50
mm. *Ibid.*, No. 1825. Upon the same occasion.

1927. Obverse. Bust of Josef II. Wirt.

Reverse. The building. Cvrandis Militvm (etc.) Silver.
60 mm. *Ibid.*, No. 2164.

Upon the foundation of the Medico-Chirurgical Military Academy at Vienna. See No. 1377, which was by Donner. Academia | Medico | Chirvrgica | Militaris

1928. Obverse as preceding.

Reverse. Bene Merentibvs | De | Arte Medico Chirvr= | gica | Præmivm. Silver. 50 mm. *Ibid.*, No. 2166.

Prize medal of the above. Two others were given at this military medical college. They were founded by Dr. Brendel, of Vienna, and have already been described, Nos. 1859 and 1860.

SECTION XII.

Meran, Austria.

1929. Obverse. Upon an irregular shield, surrounded by a vine branch, a mountaineer with Tyrolese flag, waving his hat, which bears a feather. Exergue : G.A.S.

Reverse. A full-breasted female, facing, supports two armorial shields. In front, and at each side, a flower of Edelweiss. Inscription, upon a scroll : Denke An Meran Below, upon a broader scroll, 1886 Silver. 23. To commemorate the semi-centennial Kur-Jubilee. In my collection.

SECTION XV.

1930. The hospital of S. Spirito, at Rome.

Obverse. The façade MDCCCLXVI.

Reverse. Nosocomium Sancti Spiritus Pio IX Pont. Max. Aqua Luce Aere Longius Imissis Aequabilis Atributis Istauratum Est Novisque Operibus Excultum Achille Maria Riccio Collegii Magistro. Bronze. Communicated to me by Professor Carlo Minati, of Pisa. See also Nos. 1621 and 1622.

1931. The hospital of St. James, at Rome.

Obverse. Bust Gregorius XVI. Pont. Max. An. XIV.

Reverse. Valetudinario Incurabilium Ad. S. Jacobi In Angusta. Restituto Ampliato An. MDCCCXLIV. Bronze. In the Minati collection.

The following has place among the medals of Sanitation :

1932. Medal struck by the IXth Italian Hygienic Congress, at Genoa, 15 Sept., 1880, in honor of the Duchess Galliera, for her munificent improvements of the country. In the Minati collection.

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

MEDICAL CONGRESS ON TUBERCULOSIS.—*Le Progrès Médical* of August 1st says of the Congress of Tuberculosis, held in Paris July 27th, 1891: "The work pushed on by MM. Verneuil and L. H. Petit continues to meet with the same merited success which it had on its introduction. At a time when publications are so numerous, so far reaching, and so contradictory, it is an excellent idea to organize every two years a public discussion in which a summary of the results obtained and of the points which remain unsettled can be carefully considered.

"This Congress is very different from those previously held, in the fact that its attention is directed exclusively to the consideration of a single question, and that one of the highest importance.

"The question regarding the pathology of the disease, and which was first brought out a short time before the assembling of this Congress, and is still the pivotal point in the discussion is that of the plurality of tuberculosis.

"MM. Nocard and Roux four years ago published the results of their experiments with the cultures of the tuberculosis matter peculiar to the Galinacei, which at that time was considered identical with tuberculosis of the mammiferi (human and bovine). The experiments made in the laboratories after the publication of this memoir have been made almost exclusively with these cultures, because they are much more easily managed than the natural products of tuberculosis. Thus it is that inoculations, experimental vaccinations, tests of immunity, therapeutic experiments on the microbes in *vitro* were extensively made. But Koch, at the last Congress in Berlin, stated that the characteristics of the aviary cultures seemed to him to be different from those obtained by inoculating the guinea pig with the products of human tubercles. Rivolta and Mafucci accepted this view of the difference between the two kinds of tuberculosis. In France MM.

Straus and Gamaleia published a very emphatic memoir on the subject. Aviary tuberculosis has not the same characteristics as the human form, and cannot therefore take its place in experiments in the laboratory. It cannot be inoculated into the dog nor into the goat, but these animals readily take the human form of tuberculosis. This last cannot be inoculated into the Galinacei. M. Vignal inoculated a pheasant and a guinea pig with a culture of human tuberculosis; the guinea pig died. He repeated the experiment with the same pheasant and another guinea pig with the same result, and that result was uniformly obtained through four similar experiments. The difference between the two parasites seems therefore well marked.

“It follows that some of the therapeutic measures based on the supposed resistance of the dog and the goat to tuberculosis are no longer reasonable; whatever may be their good effects we are not disposed to discuss. The clinical comparisons established between human tuberculosis and the bacillemia which the injection of the aviary culture causes in the rodents has no better foundation. As M. Darember has very frankly said: ‘For four years I have worked with aviary tuberculosis, and I think that the results thus obtained have no bearing on human tuberculosis.’ He has been, however, too severe upon himself, for many years of labor on a disease so full of interest as tuberculosis cannot be thus lost, and general conclusions of great importance to science may always be derived from facts carefully observed.

“These facts having been noted, the most piquant circumstance connected with the Congress is to observe the attitude of the different interested parties; that is to say, of all those who find themselves in the position of M. Darember. One party seems to ignore the facts completely; they continue unmoved by late developments to believe in the immunity of the goat from human tuberculosis. Others propose a retrogressive movement; these are generally the earnest workers in the laboratories. Some maintain a strict reserve, and thus far have expressed no opinion. Others of more advanced opinions, while admitting that there are differences between the two kinds of bacilli, endeavor to show that they are less constant than has been affirmed; finally, the most enlightened

declare that there is but one and the same species of bacillus, but that there are two distinct varieties.

“The question thus presented is a mere subtlety, which decides nothing; it is simply a kind of botanical question, or, if preferred, one of biological philosophy; and I do not think that many of us would be tempted to decide the question of species or variety. It is difficult to decide in the case of the vertebræ, especially since Darwin’s time. How will it be, then, in the case of microbes which are morphologically similar? But this question has no practical importance. What it is important for us to know is if the two microbes differ so much that the therapeutic and prophylactic conclusions which are deduced from the study of one cannot be applied to the other. If they do, their degree of relationship is a matter of indifference. If not we must discard the experiments of the authors whom we have cited and who form the little group who oppose the great mass who hold the opposite opinions.

“Therapeutics, which occupies the important place in the consideration of the present Congress, depends almost exclusively on the solution of the previous question. The chloride of zinc, oil with creosote and tannin are, I think, the only remedies among the new remedies to be excepted. They must stand the test by their merits. The same three indications are always found present in the long list of remedies proposed for the treatment of tuberculosis in cases that have made but little progress to improve the appetite, to increase the weight, and to give additional vigor to the system; all the remedies employed so far have given the same results. There are sceptics who pretend that rest, hygiene, and the treatment of symptoms as they arise do as much for the patient. Without wishing to discourage the therapeutists, it must be admitted that the specific treatment of pulmonary tuberculosis, if such a thing can be said to exist, will not be determined by the present Congress.

“We repeat it, the question of pathogeny is the most important of all; and the open discussions which will occupy the whole of this week will produce very important results, for they will remove all doubt and all confusion with regard to the identity of aviary tuberculosis with that which is found in human beings.”

ACCIDENTAL INOCULATIONS WITH TUBERCLE.—The presence of the tubercle bacillus affords a ready proof for the local development of a tubercular manifestation which has resulted from accidental inoculation. Jadassohn records two cases of lupus which had developed in this way. One patient was a butcher, upon whose finger-tip an ulcer developed, and subsequently a typical lupus patch formed on the forearm, and another on the upper arm. The discovery of tubercle bacilli in the lesion proved it to be tubercular. In the second case, the lupus developed on the site of a tattoo, and coincided exactly with the lines of the tattooed design. The operator, it appeared, was phthisical, and had used his saliva in mixing the colors.—*Med. Press.*

CANE DISEASE.—In the *Revista de med. y cir. prac.*, Vicente Gomez gives three cases of professional disease due to reeds. The first case was that of a man of 49 years who had worked in the reeds for the last ten years. On August 2d he was engaged in gathering the reeds together which had been cut during the preceding winter and had been exposed to the weather without being separated. They were covered with a fine ash-like dust, which was diffused into the air when the canes were moved. On the evening of the first day after he had been at work for a short time, he was attacked with an intense cephalagia, followed by want of appetite and insomnia; urine scanty, perspiration profuse. The next day there was a sensation of heat, epistaxis, with painful swelling of the mucous membrane of the nose and mouth, which rendered movements of the eyelids difficult; there is also pain on the side of the external genital organs. On the sixth day, loss of appetite, fetid breath, dry tongue; some fever and slight albuminuria; on the cheeks are small scales of a dull color. The prepuce is inflamed, presenting complete phimosis; the least touch is very painful. There were two other cases of the disease noted, but in these, the workmen, seeing the powder rise in a cloud when the canes were moved, and knowing their danger, by experience, left their work. This powder is generally found on reeds which have been collected on marshy ground and have been exposed to the action of humidity and heat; the danger is increased if the workers are in a state of

perspiration, and the severity of the attack is in proportion to the amount of the powder present. The author attributes the affection to products of fermentation which develop in the reeds. The disease is known in France under the name of the *Maladie des cannes de Provence*.

PHYSICIANS in writing prescriptions often add substances which have no therapeutic effect, but which are useful in imparting a better odor or taste to drugs that are disagreeable and repulsive. I have for a considerable time used Listerine for this purpose, especially in gargles, or sprays, or nasal douches. No physician would be justified in prescribing a medicine even for flavoring purposes that he did not know the composition of ; but the ingredients of Listerine have been published to the profession, and are vegetable antiseptics, which are destructive to microbic life upon any of the surfaces to which they are applied, hence, in the treatment of the infectious maladies attended by inflammation of those surfaces, which are accessible, as scarlet-fever, diphtheria, and pertussis, Listerine may, if correctly used, be a useful remedy, not only for its agreeable properties, but still more for its destructive action on microbes. In such cases I expect to continue to use Listerine.—*J. Lewis Smith, M.D., in Journal of Balneology and Dietary.*

MAGNESIA holds it own as the most efficacious antacid and aperient for infants and others with delicate stomachs, in the materia medica ; and of all forms of administration, Phillips Milk of Magnesia—a mere hydrated magnesia fluid—is the most eligible.

LACTO-CEREAL FOOD is highly recommended by a large number of physicians who have used it, for, being highly nutritious and acceptable to the stomach ; it is neutral in its effects on the bowels, being neither laxative nor constipating.

The starch in the wheat and barley has been dextrinized so as to render it easily digestible. In general character and constituents this would seem to be an *ideal food*.—*Epitome.*

THE PROGRESS OF INFECTIOUS DISEASES AND DEATH RATES AT THE MOST RECENT DATES.

COMPILED BY HARRY KENT BELL, M.D.

ALABAMA.—*Mobile*, 31,076 : Reports 64 deaths during July, of which 26 were under five years of age. Annual death-rate, 24.6 per 1000. From zymotic diseases, 14, and from consumption, 9.

CALIFORNIA.—Reports from sixty-six cities, towns, and localities, having a population of 695,866, during July, show 1096 deaths to have occurred from all causes. Annual death-rate, 18.84. Deaths from consumption, 141 ; pneumonia, 45 ; bronchitis, 12, and congestion of the lungs, 5. Croup and diphtheria caused 44 deaths ; typhoid-fever, 38.

San Francisco, 330,000 : Deaths during the month of July, 580. From consumption, 74 ; acute lung diseases, 46 ; croup and diphtheria, 17 ; typhoid-fever, 20. Death-rate, 17.57.

Los Angeles, 53,394 : Deaths, 54. From consumption, 9 ; acute lung diseases, 3. Death-rate, 12.15.

Oakland, 50,000 : Deaths, 72. From consumption, 15 ; acute lung diseases, 0. Death-rate, 17.16.

CONNECTICUT.—The mortality report for July comprises 166 towns. There were 1299 deaths reported in the State during the month. This was 322 more than in June ; it was only 1 less than in July, 1890, and 13 less than the average number of deaths in July for the five years preceding the present.

In the first seven months of this year the number of deaths was 335 less than in the first seven months of 1890, and 482 more than the average of the same months of the five years preceding.

The annual death-rate of the large towns was 25.9 for July as against 17.3 for June.

The two cities having the highest death-rate were Waterbury, 42.2 and Hartford, 28.1. The two cities having the

smallest death-rate were Middletown, 11.8 and New Haven, 18.1. The average annual death-rate for the large towns was 25.9, while that of the small towns was only 14.8. This is a much wider difference than usual.

The deaths from zymotic diseases were 471, being 36.2 per cent of the total mortality against 20.4 per cent in June.

New Haven, 86,045 : Deaths, 144—under five, 60 ; from zymotic diseases, 47. Death-rate, 18.1.

Hartford, 53,230 : Deaths, 141—under five, 53 ; from zymotic diseases, 48. Death-rate, 28.1.

Bridgeport, 48,866 : Deaths, 97—under five, 51 ; from zymotic diseases, 51. Death-rate, 22.1.

DISTRICT OF COLUMBIA, 250,000 : Reports for four weeks ending July 25th, 507 deaths, of which number 239 were colored. Annual death-rate per 1000, 26.31.

From zymotic diseases there were 182 deaths, and from consumption, 47.

ILLINOIS.—*Chicago*, 1,200,000 : Deaths during the month of July, 2275—1302 under five years of age. Death-rate, 22.75. From zymotic diseases, 893 ; consumption, 164.

IOWA.—*Davenport*, 28,500 : Reports for July, 24 deaths—10 under five years of age. Annual death-rate per 1000, 23.5.

LOUISIANA.—*New Orleans*, 254,000 : Reports for four weeks ending July 25th, 485 deaths, of which 183 were colored, and 156 were under five years of age. Annual death-rate, 24.65 per 1000.

There were 73 deaths from zymotic diseases and 36 from consumption.

MARYLAND.—*Baltimore*, 455,427 : The total deaths in July were 1096, an excess over the corresponding month of July, 1890, of 183. Of these, 832 were white and 264 colored ; a death-rate of 26.00 per 1000 for the former, and 44.61 per 1000 for the latter. The death-rate for the whole population was 28.90 per 1000—36 persons died from infectious diseases, 95 from consumption, and 259 from cholera infantum ; 595.

or 54.00 per cent of the total deaths, were in children under five years of age. During the month 137 cases of infectious diseases were reported, a decrease of 30 over the preceding month.

MASSACHUSETTS.—*Boston*, 459,062: During July, 1891, deaths reported, 1006, of which number 532 were under five years of age. Annual death-rate per 1000, 26.29. From zymotic diseases, 311, and from consumption, 115. Cases of contagious diseases reported, 183.

MICHIGAN.—For the month of July, 1891, compared with the preceding month, the reports indicate that cholera infantum, inflammation of brain, cholera morbus, whooping-cough, dysentery, diarrhoea, diphtheria, scarlet-fever, inflammation of bowels, cerebro-spinal meningitis, intermittent-fever and typhoid-fever (enteric) increased, and that pneumonia, erysipelas, and measles decreased in prevalence.

Compared with the preceding month, the velocity of the wind was greater, the prevailing direction west (instead of northeast), the rainfall was more; the temperature was lower, the absolute and relative humidity were less, the day ozone and the night ozone were slightly more.

Compared with the average for the month of July in the five years 1886-90, influenza, scarlet-fever, diphtheria, tonsillitis, and inflammation of bowels were more prevalent, and small-pox, typho-malarial-fever, erysipelas, and whooping-cough were less prevalent in July, 1891.

For the month of July, 1891, compared with the average of corresponding months in the five years 1886-90, the velocity of the wind was greater, the prevailing direction of the wind was west (instead of southwest), the temperature was lower, the absolute and relative humidity were less, the day ozone was less and the night ozone was more.

Including reports by regular observers and others, diphtheria was reported present in the month of July, 1891, at sixty-six places, scarlet-fever at eighty-two places, typhoid-fever at sixty-three places, and measles at fifty-two places.

Reports from all sources show diphtheria reported at eleven places more, scarlet-fever at seventeen places more, typhoid-

fever at thirty-eight places more, and measles at twenty-six places less in the month of July, 1891, than in the preceding month.

Detroit, 220,000 : During July, deaths, 414—under five years of age, 130. Death-rate, 22.15. From zymotic diseases, 175 ; from consumption, 29, and from pneumonia, 4.

MINNESOTA.—*St. Paul*, 150,000 : Deaths during July, 226—160 under five years of age. Deaths from zymotic diseases, 91 ; from consumption, 9. Death-rate, 18.06.

MISSOURI.—*Kansas City*, 132,416 : Deaths during July, 168—80 under five years of age. From zymotic diseases there were 58 deaths, and from consumption, 22. Annual death-rate per 1000, 12.6.

NEBRASKA.—The following physicians have been elected secretaries to the State Board of Health : J. C. Beghtol, Friend, Regular, one year ; F. D. Haldeman, Ord, Regular, two years ; —. —. Stewart, Auburn, Eclectic, three years ; E. F. Allen, Omaha, Homœopathic, four years.

NEW JERSEY.—*Hudson County*, 283,850 : Deaths during July, 739—under five years, 446. From zymotic diseases, 274 ; from consumption, 60. Death-rate, 31.2.

Paterson, 78,358 : Deaths during July, 205—120 under five years of age. Death-rate, 25.2. Deaths from zymotic diseases, 106 ; from consumption, 9.

NEW YORK.—The Secretary of the State Board of Health reports that in 135 cities, villages, and large towns having an aggregate population of about 4,300,000, there were 9760 deaths during July, making a death-rate of 25.00 per 1000 per annum. For the same places in June the death-rate was 22.78. For the remaining portion of the State, consisting of scattered rural towns, the death-rate is about 13.25 per 1000 per annum. A little more than half the deaths occurred under the age of five years, the proportion being almost exactly the same as in July, 1890. There were 3750 deaths from ordinary zymotic diseases, or nearly one third the total

mortality ; of these, 2900 were from diarrhœal diseases, which number varies little from that of a year ago, or from the average for the past six years. In the rural portion of the State only 20 per cent of the deaths occurred under the age of five years, and only 80 of the 2900 deaths from diarrhœal diseases occurred there. There were 2100 more deaths from diarrhœa than in June, and there was just this increase in the total number of deaths. July has uniformly the highest death-rate of any month in the year, on account of the large number of deaths from diarrhœa. In the other zymotic diseases there is little change from that reported last month. From all respiratory diseases the mortality corresponds very closely with that of July, 1890.

New York, 1,680,796 : Total deaths, 4261—2518 under five years. Death-rate, 29.85. Zymotic diseases per 1000 deaths from all causes, 287.70. Deaths from consumption, 387.

Brooklyn, 862,155 : Total deaths, 2317—1460 under five years. Death-rate, 31.57. Zymotic diseases per 1000 deaths from all causes, 409.58. Deaths from consumption, 182.

Albany, 100,000 : Total deaths, 191—71 under five years. Death-rate, 22.92. Zymotic diseases per 1000 deaths from all causes, 287.95. Deaths from consumption, 19.

Syracuse, 88,000 : Total deaths, 150—82 under five years. Death-rate, 20.45. Deaths from zymotic diseases per 1000 deaths from all causes, 360.00. Deaths from consumption, 17.

Buffalo, 255,000 : Total deaths, 575—368 under five years of age. Death-rate, 27.05. Deaths from zymotic diseases per 1000 deaths from all causes, 427.80. Deaths from consumption, 44.

Rochester, 138,327 : Total deaths, 227—96 under five years of age. Death-rate, 19.70. Deaths from zymotic diseases per 1000 deaths from all causes, 312.68. Deaths from consumption, 21.

NORTH CAROLINA.—*The Bulletin of the State Board of Health* reports the following : In fourteen towns, with 44,814 white and 38,112 colored inhabitants, there were during the month of June 68 deaths among the whites and 77 among the colored ; the respective annual death-rates were 18.2 and 24.2. Deaths under five years of age numbered 76.

There were 43 deaths from diarrhœal diseases, 12 from consumption, 4 from pneumonia, and 7 still-born.

Wilmington, 21,000 : Total deaths, 47—29 under five years of age. Annual death-rate, 26.9 per 1000.

Raleigh, 15,000 : Total deaths, 36—24 under five years of age. Annual death-rate, 28.8 per 1000.

OHIO.—*The Monthly Sanitary Record* reports that in ninety-four cities and towns, with an aggregate population of 1,231,702, there were, during the month of July, 2109 deaths, of which number 852 were under five years of age. Deaths from zymotic diseases numbered 756, and from consumption, 182.

Cincinnati, 296,908 : Deaths, 533—under five years, 129 ; from zymotic diseases, 173. From consumption, 61. Death-rate, 21.20.

Cleveland, 261,353 : Deaths, 643—under five years, 323 ; from zymotic diseases, 282. From consumption, 27. Death-rate, 29.61.

Columbus, 88,000 : Deaths, 118—55 under five years ; from zymotic diseases, 36. From consumption, 11. Death-rate, 16.06.

Mansfield : The Third Annual Report of the Health Department for the year ending February 28th, 1891, is a document of 80 pages, and contains much valuable information regarding the sanitary condition and needs of the city.

The mortality table shows the total number of deaths for the year to have been 155, which, with an estimated population of 15,000, equals an annual death-rate of 10.33 per 1000 inhabitants, and for the census population—13,473—11.50 per 1000. Thirty-four deaths were of children under one year of age.

The infectious diseases reported during the year were 24 cases of diphtheria, 10 cases of scarlet-fever, 1 case of measles, and 7 cases of typhoid-fever ; deaths, 17.

PENNSYLVANIA.—*Philadelphia*, 1,069,264 : In the four weeks ending July 25th, there were 1946 deaths, of which 1019 were under five years of age. Annual death-rate per 1000, 23.7. From zymotic diseases there were 617 deaths, and from consumption, 179.

Pittsburg, 247,000 : Reports for four weeks ending July 25th, 535 deaths, of which number 304 were under five years of age. Annual death-rate, 28.01 per 1000. From zymotic diseases there were 185 deaths, and from consumption, 40.

TENNESSEE.—At the quarterly meeting of the State Board of Health, held at Nashville, July 7, 1891, Dr. Wright called up the resolution which was laid over at the April meeting for consideration at this session, which is as follows :

Whereas, It has been demonstrated by experiment that tuberculosis has been communicated by vaccine lymph taken from tuberculous cows and that goats have been shown to be incapable of tuberculous infection, while variolous lymph pursues with them the same course as it does in cows and is equally effective on the human subject as a prophylaxis against variola ; therefore, be it

Resolved, That it is the duty of the medical profession to promote and encourage the gradual and cautious substitution of caprine for vaccine lymph.

After a full discussion the Board adopted the resolution.

The principal diseases, named in the order of their greater prevalence, in the State for the month of July, were : Non-contagious diseases—malarial fevers, dysentery, diarrhœa, cholera infantum, cholera morbus, rheumatism, consumption, and pneumonia. The contagious and infectious diseases reported are : Typhoid-fever in Davidson, Franklin, Gibson, Hamilton, Henry, Lincoln, Maury, McNairy, Moore, Overton, Robertson, Rutherford, Unicoi, and Washington ; whooping-cough in Blount, Davidson, Franklin, Lincoln, Maury, Robertson, and Rutherford ; scarlet-fever in Davidson, Henry, Knox, Madison, Montgomery, and Shelby ; measles in Davidson, Lincoln, McNairy, and Rutherford ; diphtheria in Knox and Shelby ; influenza in Madison ; meningitis in Unicoi.

Chattanooga, 30,000 : Total deaths, 50—32 colored. Annual death-rates, 18.00 white, 38.40 colored per 1000.

Knoxville, 43,706 : Total deaths, 61—23 colored. Annual death-rates, 13.12 white, 30.83 colored per 1000.

Memphis, 60,000 : Total deaths, 124—71 colored. Annual death-rates, 19.27 white, 31.55 colored per 1000.

Nashville, 76,309 : Total deaths, 163—92 colored. Annual death-rates, 17.94 white, 38.28 colored per 1000.

WISCONSIN.—*Milwaukee*, 230,000 : Deaths reported during July, 350, of which 113 were under five years of age. Annual death-rate, 18.26 per 1000. From zymotic diseases there were 101 deaths, and from consumption, 27.

INFECTIOUS DISEASES ABROAD.

Translated by DR. CORBALLY.

CHOLERA IN ASIA.—According to the following communication presented to the Comité Consultatif d'Hygiène Publique de France, published in *Progrès Médical*, July 25th, 1891, cholera in Calcutta, at latest accounts, prevails epidemically. May 20th the Medical Board registered 50 deaths from it which had taken place during the preceding week.

Cholera in Syria, it will be remembered, appeared about a month ago at the "Caza de Harim," situated about one day's journey from Mecca. From June 9th to July 5th the bulletin records the following as the number of deaths : at Hammou, a small village, twenty-five ; at Harim, twenty-four ; at Killi, fourteen ; at Aleppo, three ; at Antioch, one ; total, 72, against 35 in the previous bulletin.

While all these figures are, no doubt, below the real numbers, still it may be said that so far the disease has not made very rapid progress ; however, since July 12th it has increased very rapidly at Aleppo. The situation in Assyr still remains uncertain ; war and revolution are in existence there at present. From a despatch dated July 12th, which brings news from Alden, it appears that cholera prevails at Massanah. Since the departure of the *Sculptar* from Bombay with its pilgrims, having cholera on board, or at least infected with it, the disease has been observed at Camaran ; seven of those passengers, four Ottomans and three Afghans, have not resumed the journey ; the former having obtained permission to remain at Camaran, and the latter were hidden in a village on the island, whence they did not return until after the departure of the *Sculptar*. These occurrences could not have taken place without the connivance of the guards and soldiers charged with watching the lazaretto. They show the kind of

protection afforded at Camaran, and cause fear for what may take place at Mecca this year.

Up to July 20th there had arrived at the port of Djeddah only 25,000 pilgrims, which was very few, considering that the date of the feast of Kourban-Baïram took place on July 17th. The number present on that occasion does not seem to have exceeded 50,000, but it was made up largely of the people of Hedjaz and the thousands of Bedouin robbers who hover around the routes for the purpose of plundering the caravans and individual pilgrims. One caravan, consisting of 2000 or 3000 pilgrims, went from Mecca about the end of June to visit the tomb of the prophet ; they ought to return to Mecca for the celebration of the fêtes.

Different despatches have announced the appearance of cholera at Mecca. On July 11th three cases were found among those who came from Medina, and one among those from Djeddah. On July 15th 35 cases of cholera were recorded at Mecca ; July 18th, 140 deaths from cholera at Djeddah. The Sanitary Council of Alexandria have adopted strict measures regarding the return of the pilgrims from Mecca. The Delegate to the Council of Hedjaz has been on board the French steamer Gallia. He has reported the existence of a disinfecting stove, a pulverizing apparatus, and a douche for the use of the pilgrims. He has certified also that a physician, appointed by the French Government and paid by the company, was on board during the pilgrimage ; he adds that the same has been done on all the boats carrying pilgrims in the French possessions.

Cholera in Asia is the subject of another communication to the Comité Consultatif d'Hygiène Publique de France, reported in *Le Progrès Médical* for August 1st. The disease continues to spread in Arabia, especially in the direction of Aleppo and the Red Sea.

In Syria, at Hérin, at Hammou, at Killi, at Alay-Bey, and at Antioch ; the official statistics, though, are always below the reality : 72 cases are reported from June 9th to July 5th. A despatch from Aleppo, July 30th, reports 157 cases, of which 69 were fatal in the city between July 2d and July 19th. On July 22d 189 cases were known to exist at Aleppo.

At Mecca the following deaths have been officially reported

from cholera : July 12th, 35 ; July 13th, 22 ; July 14th, 27 ; July 19th, 383 ; and one at Djeddah. From July 20th–22d 1121 cases reported at Mecca and three at Djeddah.

The Austrian Government has ordered a detention for observation of seven days of all those coming from the Gulf of Alexandria and the Red Sea. These rules are applicable only to vessels which have made the passage under normal conditions ; in other cases the maritime authorities reserve the right to dictate special regulations.

The Governor of Cyprus has ordered a detention of ten days at least for those coming from the same places to the port of Larnaca.

The Egyptian Government has received from the Government of the Sublime Porte a communication in reference to the measures adopted for the purpose of ameliorating the hygienic condition of Djebel-Jor.

The measures proposed by the Sublime Porte may be summarized as follows : 1. Subject all persons passing through the Suez Canal and those coming from the Red Sea to a quarantine when cholera exists on either shore of the Red Sea ; 2. To construct lazarettos in masonry or in wood in conformity with the new system, and distant from one another at least 50 metres, and capable of accommodating forty to fifty persons each ; 3. To erect hospitals at a certain distance from the lazarettos, to prevent all communication between those having cholera and patients with ordinary diseases. The International Council at Alexandria, by a vote of 10 to 2, has decided to authorize the Ottoman steamer *Kaiserich* to pass through the Suez Canal under quarantine regulations. Eight members did not vote.

The epidemic of cholera in Mesopotamia, Persia, and Syria in 1889 and 1890 was the subject of a communication to the Academy of Medicine by M. Proust recently, in which he demonstrates the fact that it was imported from India by way of the Persian Gulf. Into Medjaz it was brought by way of the Red Sea. All reports agree in referring its origin to India, and urge that constant surveillance ought to be exercised on the Persian Gulf and the Red Sea, by which routes the steamers may bring the germs of an epidemic very speedily into Europe.

In Aleppo the disease continues to increase, according to

latest accounts. *Le Progrès Médical* of August 8th reports that, according to announcement made to the Comité Consultatif d'Hygiène Publique de France, from July 20th–26th there were 125 deaths from cholera in Aleppo, of which number 113 were in the village proper. Since the beginning of the epidemic there have been about 600 deaths. The Board of Health of Gibraltar has ordered a quarantine of five days for all coming from Aleppo. At Malta twenty-one days have been prescribed for all coming from the same place; and the Bulgarian Government has ordered fifteen. The pilgrims are thoroughly frightened, and have directed their course toward Medina and Taif, in order to follow the route of the caravans, the greater number going toward Djeddah.

As usual, the separation of the great numbers brings a diminution of the epidemic; but it is feared that the disease, having so much intensity, will follow the unfortunate Hadjis for a long time, both by sea and land. The same measures as adopted last year have been continued. Cholera continues with great intensity at Massanah; Europeans have been attacked with equal fatality. The measures taken by the Italian Government against arrivals from the infected places have not yet been announced. The Health Physician at Teheran reports the existence of an epidemic at Korassan which threatens the Russian possessions in the Trans-Caspian, Merv, and Russian Turkestan.

SMALL-POX.—A despatch from Lisbon brings the information that an epidemic of small-pox prevails at Saint Vincent du Cap-Vert.


TYPHOID-FEVER.—M. Henri Monod, Director of Public Charities and Hygiene, has made a report on the sanitary condition in the interior of France. Exanthematic typhus, which had disappeared from the isle Tudy, has reappeared.

Dr. Thoinot left on July 26th for Finistère. The Committee will be kept regularly informed regarding the results of his mission.

Typhoid-fever exists, and is on the increase in Compiègne. On the hospital bulletin of that city were recorded for the week from June 28th to July 5th one case; six from July 5th–12th; nine from 12th–19th, of which eight were civilians. The doctor in charge has been notified to send an official report.

EDITOR'S TABLE.

Removal.—A. N. Bell, M.D., the Editor hereof, has changed his residence from 113a Second Place to 291 Union Street, Brooklyn.

 ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, Brooklyn, N. Y.

THE CROTON VALLEY WATER-SHED is again the subject of investigation. Readers of THE SANITARIAN will readily recall the description of this area in Volume XVI., and the numerous sources of pollution of the New York water supply which at that time obtained, to which—and their increase—attention was again urged in Volumes XXI. and XXII. ; and, moreover, to the elaborate investigation by the State Board of Health, comprising “rules and regulations for the sanitary protection of the Croton River and its tributaries,” 1889.

According to the earliest of the reports here referred to—1885—the area inspected at that time embraced 239 square miles. It comprised 20,000 persons, 1879 dwelling-houses and cesspools, 602 barns and barn-yards, 9453 cows, 1224 horses, 1501 pigs, and twenty sheep. There were, besides, thirty saw and grist mills, nineteen blacksmith shops, five cemeteries, four slaughter-houses, three cider-mills, three carriage factories, two condensed milk factories, two iron-mines, one tannery, one cement factory, one woollen mill, and one machine shop. There was no drainage except surface ; everything that was soluble and of much that was insoluble was discharged into the tributaries of the water supply. And, as stated by Professor C. C. Brown, C.E., in his report to the State Board of Health three years subsequently, “during the spring freshets the rivers overflow their banks from four to fifteen feet, and all privy vaults within that range are overflowed and washed out.”

Moreover, Professor Brown found that in the enlarged area of the water-shed of the new reservoir to 361.82 square miles,

the population was 25,000 ; the number of houses 5056, outbuildings 5612 ; and of these houses and outbuildings, the number respectively deserving special mention as sources of pollution was 2843 and 3293 ; and the number of domestic animals pertaining to them requiring special attention was about 18,500—the total number on the water-shed being about 33,000. Besides, a very fertile source of pollution is the drainage from roads and streets into the water-courses in times of rain. The character of this pollution he characterized as being particularly obnoxious in spring or late winter rains, after the accumulation of the droppings upon the roads during the whole winter.

The increase of population in the area since 1888 has probably been upward of 1000, and proportionally all the sources of pollution have increased.

In summing up the "general sources of pollution," Professor Brown singularly omits cemeteries and graveyards, of which there are, according to his tabular statement, pertaining to towns, 83 ; to villages and hamlets, 28.

Estimating the death-rate to be 20 per 1000, the number of interments in the area of the Croton water-shed annually is upward of 500.

The omission to attach any particular importance to this source of pollution is the more remarkable when taken in connection with the geological formation of the soil.

"The surface soil is generally very porous in character, containing sand or gravel in large proportions. There is but little clay on or immediately under the surface, though clay and 'hard pan' are found in some places at greater or less depths below the surface."

Certainly very favorable to speedy soakage in relation with the subsoil currents into the water-courses under the same conditions as the drainage from roads and streets, but more dangerous, because the human dead bodies, from whatever cause, are deprived of the mitigating effects of air and sunshine and protected from contact with the earth, while they are exposed to the subsoil currents which penetrate the coffins, take up everything that is soluble during the process of putrefaction, and convey it into the water-courses at all seasons. This danger seems to have been feebly recognized by the State

Board in the Rules and Regulations adopted on Professor Brown's report in that

"No interment shall be made in any cemetery or other place of burial on the entire water-shed of the Croton River, or on those portions of the water-sheds of the Bronx and Byram rivers now used for the water supply of the rivers of New York, within two hundred and fifty feet, horizontal measurement, of the high-water mark in any lake, pond, or reservoir, or within one hundred and thirty feet, horizontal measurement, of the high-water mark or precipitous bank of any spring, stream, or water-course tributary to such lakes, ponds, or reservoirs."

This rule pretty clearly indicates the necessity for it in the mind of the Board, but in reality, of much more stringent measures; for we find it difficult to conceive how any Board of Health worthy of the name can countenance cemeteries at all within the drainage scope of a potable water supply, but it is astounding that the State Board of Health of New York should conceive it practicable to formulate any regulations whatever for the continuance of the deadly practice of interring upward of five hundred human corpses annually within the drainage scope of the water supply of the city of New York. This rule, however, like twenty-six other rules and regulations based upon Professor Brown's report, more or less accommodating to the selfish propensities of those who indulge no thought for the lives of other people, amounted to nothing.

The shifting responsibilities of the State, city, and local Boards of Health for killing people all the year round have served to prevent any action whatever for the abatement of the death-dealing nuisances.

The investigation by the State Board, like many other investigations it has made (of Newtown Creek, for example), with supposed plenary power under the law, in conjunction with the Governor of the State, to abate the evils revealed, has encountered the usual political lion in the way, and been vanquished.

After three years' waiting, apparently for the result of the State Board's investigation, the City Board has essayed to go over the same ground, with the pretended purpose of gain-

ing information on a subject with which it has been familiar for more than a dozen years, beginning before the existence of the State Board, and discovered at the outset of the undertaking that it has been deprived of the power which it long before possessed, but neglected to use, to protect the city water supply. With some show of alarm at the recent increase in the mortality, justly attributable to the use of polluted water, and the new evidence of impurity revealed by chemical analysis, it has adopted a series of resolutions : To forward reports of its findings to the State Board of Health, calling the attention of said Board to the nuisances existing in the Croton water-shed, in violation of the " rules and regulations for the sanitary protection of the Croton River and its tributaries in the counties of Westchester, Putnam, and Dutchess," and requesting that said Board take such action as may be necessary to protect the water supply of this city from contamination ; To the Commissioner of Public Works, calling his attention to the danger to the water supply of this city from various nuisances existing in the Croton water-shed, including those upon city property, and to the necessity of immediate measures for the removal of all the ascertained causes of nuisance and of contamination of the Croton water ; To the Commissioners in charge of the new Croton aqueduct, with the request that they take immediate measures for the removal of any nuisances on city property which is under their control, that may in any way contaminate the water supply of this city ; and that The Board of Health deems it a duty to press upon the immediate attention of his Honor the mayor of the city the dangers disclosed by the reports of recent inspections, by the contamination of the water supply of the city from a number of sources—which are rehearsed in detail, as if for the first time discovered, and which would have been prevented long since had the said Board of Health not neglected its duties.

The response to these several references thus far has been as follows :

The Secretary of the State Board called attention to his report two years ago, and said it was an old matter ; there were twenty-five hundred sources of contamination, and, as reported, said :

"Let me tell you a scientific fact ; no matter how little sewage may at first contaminate a running stream of water with as little current as the Croton, eventually the sediment settling at the bottom will so thoroughly saturate the water that very soon the water will refuse to take or consume any more, and then the water is unfit for use. Then, as time goes on, as it has since our investigation of the Croton shed, and there is no abatement of the nuisance, why, the water begins to be filled with dangers to those who partake of it."

Ex-Aqueduct Commissioner, Hamilton Fish, Jr., on inquiry with regard to power, said :

"The law gives us power to publish rules in local papers or file them with the County Clerk, making regulations to prevent the contamination of water by abating nuisances. After we have so published, the rules are laws, and local boards are supposed to see to the carrying out of them. In these cases we at once started to abate the nuisances, and the local boards were authorized to begin proceedings. If not abated within thirty days, the boards were to have them abated, and compel the owners of land to pay the costs. When we began to force these abatements along the Croton water-shed the farmers began to make a kick, and the outcome was that an amendment was introduced and passed compelling the municipality benefited to stand the expense. Then the farmers began to put on fancy prices, and so the nuisances continued by default of proceedings. So lately the work of stopping the pollution has ceased."

Commissioner (of Public Works) Gilroy lamented the fact that the want of proper legislation so tied the hands of the Department of Public Works that they could do nothing whatever to suppress the nuisances. He said :

"I propose to show that this is no new condition of affairs, but that it has been known to this department for some time. I have reported over five hundred such cases as those specified to the Health Board within a year.

"What are we going to do about it? Well, I don't see that we can do anything at all until some new law is passed giving us back the power that was taken from us last winter.

"Previous to the Act of 1890 we had power to act in such cases, although in a roundabout way. Still we could do something. Then we were authorized to police this water-shed, to ascertain the location and character of any existing nuisances, and to serve the parties causing the trouble with a copy of the rules and regulations of the State Board of Health. If nothing was then done to abate the nuisance the State Board took its

turn in serving notices. In case this was ineffectual the local Board was finally ordered to attend to the matter.

"All this combined pressure generally produced the desired result, and finally we had the region fairly well purified."

The Act of which Commissioner Gilroy complains is chapter 468 of the laws of 1890, approved by Governor Hill, June 2d of that year. If the removal of buildings is involved in the enforcing of the State Board's regulations, the municipality owning the water works must remove the buildings and pay the owner all damages sustained. Any manufacturing or industrial company damaged by the enforcement of the health regulations must be compensated.

It is also provided that no action can be taken against any person or corporation in the Croton water-shed for the violation of any State Board of Health regulation until the city has changed the system of sewerage and removed the buildings in accordance with the Act, and no person or corporation shall be considered as having violated or refused to obey such regulations. Moreover, the owners of any buildings removed by order of the State Board can sue the city for damages in the county where the property is situated.

Under the privilege of this Act, one of the condensed milk manufacturers was found by the inspector to have constructed new privies for operatives in place of old ones that were a source of pollution to the water supply, but he refused to allow his new ones to be inspected even, and persists in the use of his old ones until he has been remunerated for his outlay.

General Duane, the President of the Aqueduct Commission, said the Commission had no authority to act in the matter. Their duties were merely to build dams and aqueducts.

Such has been the progress of legislation during recent years, in *not* maintaining home-rule for the city of New York, and *not* holding its Board of Health responsible for the proper protection of her water supply.

The Park Place disaster, on the 22d ult., which, in consequence of the cupidity of the owner of an unsafe building, resulted in the death of sixty-two persons, has not only shocked the sensibilities of the whole population of the city, but of the country generally. And the owner of the death-trap de-

pendent, it may be, on the income of its rents for his living, is held up before the people all over the country as pre-eminently deserving denunciation and punishment for his negligence. But what are the sixty-two deaths as the result of that disaster in comparison with the daily stream of disease and death among the million and a half people of the city consequent upon the neglect of officials to protect the water supply?

THE SANITARIAN would be the last to excuse the culpable builder or owner, but it would lead the way to an equally searching inquiry to discover and punish the responsible officials for killing people with polluted water, as being no less culpable than jerry builders or avaricious landlords.

Besides the opinion of the expert before cited, with regard to the cumulative danger of polluted water, the recent chemical analyses have startled the city Board of Health by the discovery of *nitrites*—the indubitable evidence of *animal putrefaction*.

The putrefaction of human dead bodies on the Croton Valley water-shed sufficiently accounts for the presence of nitrites in the water even independent of the other six thousand one hundred and forty-six special nuisances, and the surface filth of thirty-three thousand domestic animals.

Will the people of New York be longer content to drink such an infusion? Can nothing be done to prohibit the burial of human bodies within the scope of the water supply?

These questions are addressed to the people of New York—not Albany.

THE NEWTOWN CREEK NUISANCE continues in unabated vigor. It appears to have escaped "investigation" this year thus far; but during the prevalence of the southerly winds in the month of August, when travel by the way of Hunter's Point was at its height, the vile odors must surely have reached Albany, thus doing away with the necessity of any special complaint to the State Board of Health, suggesting that another investigation on the eve of cold weather might be timely, as heretofore. Possibly, however, the State Board of Health, as well as the people, have lost faith in the investigations of this enduring nuisance, since, though several times made, they have never been followed by any mitigation ex-

cept that which has been justly attributable to succeeding cold weather. In short, the health authorities have done nothing but "investigate," though the nuisance has been flagrant for many years. Yet only a few weeks ago citizens were informed that their complaint was fatally defective because, while there was no doubt about the odoriferous horrors, the charges were not sufficiently specific! "And here we have," says the *Brooklyn Eagle*, "the paradoxical conclusion that an offence may be so rank, so demonstrably, overwhelmingly evident, that there is really no relief from it." There was another discussion of remedies at a Fifteenth Ward meeting, resulting in the conclusion that the people had abandoned hope. Railroad passengers and occasional visitors believe that the only thing for them to do with Hunter's Point is to avoid it.

THE TYPHOID-FEVER EPIDEMIC in Newark, N. J., is another example of official obtuseness and negligence, and of inexplicable willingness of the people to imbibe the filthiest of all filth with their drinking water. It matters not whether such filth is supplied to wells from the soakage of privy vaults in proximity with them—the process common to villages round about—or discharged into the reservoirs or rivers from which the drinking water is obtained, its character is the same.

But the Passaic River is well known to have served the double purpose of being the common receptacle of the sewage and the source of the potable water of one hundred thousand people, more or less, for many years. These people seem to have been waiting for that degree of filth saturation above stated by Dr. Balch, who, from his official capacity for several years as the executive officer of the State Board of Health, and also Health Officer of Albany (where the people have been drinking the sewage of Troy until Albany has become celebrated as a fever hatchery), and the knowledge he has acquired by the let-alone policy of the State Board in regard to the Croton, is evidently qualified to speak with authority upon the subject.

Yet there are said to be some people, and among them even some physicians, who still hold to the fatal fallacy of the late Dr. Letheby, Medical Officer of Health of London, about twenty-five years ago, that "sewage when it is

mixed with twenty times its volume of running water, and has flowed a distance of ten or twelve miles, is absolutely destroyed; the agents of destruction being infusorial animals, aquatic plants and fish, and chemical oxidation." This theory appears to have been based upon Dr. Letheby's inability to detect the sewage under such circumstances, hence he believed in its total destruction, notwithstanding abundant evidence adduced of the prevalence of cholera and typhoid-fever among persons who drank such water. He had more faith in his chemical tests and microscopes than in the fatal results. Unfortunately, Dr. Letheby's theory appears to have been accepted by Professor Chandler, of New York. It was on his judgment that the people of Albany consented to drink the sewage of Troy; and it has been through faith in his analyses and judgment that the Croton and Hudson have been held up as examples of purity, notwithstanding the amount of filth constantly poured into them, as well as the Passaic, and the high rate of mortality from intestinal diseases among those who have used these waters, which cannot otherwise be accounted for.

EUCALYPTUS AS A DISINFECTANT IN SICK-ROOMS.—Sir F. von Mueller, of Melbourne, has suggested the use of green eucalyptus branches in sick-rooms, a plan which he considers applicable in all infectious and contagious diseases. It is said to have proved successful with phthisical patients, not only upon antiseptic grounds, but also by reason of the sedative influence of the shrub upon the cough. The branches should be placed under the bedsteads, and be renewed when necessary every other day. In this country such an easy method of disinfecting sick-rooms would be highly appreciated. Unfortunately, however, it is not possible to obtain the necessary green eucalyptus branches, when required, with the same facility as we can provide ourselves with coals or any other commodity.

REPORT OF PROCEEDINGS OF INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY, London, Aug. 10th–17th, received too late for this issue.

"**THE TRUTH ABOUT VACCINATION**" will be resumed in the next number.

LITERARY NOTICES AND NOTES.

MENTAL SUGGESTION. By DR. J. OCHOROWICZ, sometime Professor Extraordinarius of Psychology and Natural Philosophy in the University of Lemberg. Four double numbers of the Humboldt Library. Price \$1.20. The Humboldt Publishing Company, 19 Astor Place, New York.

Much is nowadays said and written about *Hypnotism*: the more ancient term *Animal Magnetism* is not often mentioned. It is the common belief that whatever of truth there was in the doctrines of Mesmer, Puységur, and the rest of the "animal magnetizers" is comprised under the scientific term "hypnotism," and that the modern school of Charcot, and the school of "suggestionists" at Nancy, France, represent the highest attainment in the science and art once studied and practised by Mesmer and Puységur, and later investigated by Braid of Manchester. But here is an author who maintains that hypnotism and animal magnetism, though they have certain superficial resemblances, are radically different from each other in their phenomena and in the modes of their production, and that the facts of magnetism are incomparably the more wonderful and the more worthy of scientific study. The title of the work, "*Mental Suggestion*," well marks the difference between hypnotism and magnetism: in hypnotism *mental* suggestion is not to be thought of, but that it exists in animal magnetism is the task of this author to prove.

The author is in every way competent to treat the subject: he is a learned physiologist and physicist, as well as a psychologist—and he has studied the matter experimentally for years. He has mastered all the literature of hypnotism and animal magnetism; his book contains an enormous amount of information nowhere else accessible outside of the greatest libraries. Just because Ochorowicz first explored the ground thoroughly on his own account and then sifted the bibliography of magnetism, he is able to estimate the true value of the work of prior experimenters and prior students and theorizers.

It is simple truth to say that no student of human psychology can afford to neglect this most able and brilliant treatise—a work original in its method as in its points of view, and possessing moreover all the charms of a consummate literary style—in other words, consummate simplicity and clearness of expression. It is unquestionably the completest work on magnetism and hypnotism ever written: no author so well equipped for the discussion of the question ever attempted it before.

SEA-SICKNESS: Cause, Prevention, and Cure. Voyaging for Health, with an Appendix on Ship Surgeons. By THOMAS DUTTON, M.D., Univ. Durh., Batchelor in Medicine, University of Durham; Member of Royal College of Physicians of Edinburgh; Licentiate of the Royal College of Surgeons of Edinburgh; Licentiate of Midwifery of both colleges, etc. Second Edition. 12mo, pp. 89. London: Baillière, Tindall & Cox.

An excellent description of the conditions of sea-sickness, with a concise account of the means commonly resorted to for its relief, and of some that are new. But to the question, "Is sea-sickness curable?" the author's reply is "that it is not," though he goes on to say that it is possibly preventable, or, at least, so reducible as to occasion but little inconvenience, and that of short duration, by restricted diet as to quantity, and abstinence from all kinds of pastry and sweets a week before going to sea, and careful regulation of the bowels, with as little medicine as possible. The same directions hold good at the beginning of the voyage and of sickness. The food should be concentrated, nutritious, and taken in small portions. For the fulfilment of these conditions, *Bovinine* is particularly recommended. "It is just the very thing wanted for sea-sickness. It is already made, and the patient has only to measure out ten drops in a wineglassful of cold water or soda water, and take it every hour, increasing the dose up to one teaspoonful as recovery takes place, or is prevented, as the case may be. No other food is required." He advises every voyager to carry a bottle with him, for, in the event of not requiring it for sea-sickness, it will keep any length of time, and will be sure to come in useful as an easily assimilable

and valuable nutrient in indigestion or diarrhœal diseases as well as in sea-sickness.

The Appendix treats of a subject with which the readers of THE SANITARIAN are already familiar—the general incompetency of ship surgeons—against the need of whose services voyagers are advised to provide themselves as well as possible with medical comforts, which are enumerated and commendable, as, indeed, the whole book is to all who would acquire knowledge of the best means of enjoyment consistent with sea voyages.

PRACTICAL INTESTINAL SURGERY, by FRED. B. ROBINSON, B.S., M.D., Professor of Anatomy and Clinical Surgery, Toledo Medical College, Toledo, O., Vol. II., shares the notice of this excellent work given in our preceding number. No subject is more worthy the attention of surgical practitioners; and no work with which we are acquainted more clearly sums it up in relation with the best results. Physician's Leisure Library Series, issued monthly, \$2.50 a year; single copies, 25 cents. Detroit, Mich.: George S. Davis.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS, Vol. II., No. 2, for August, 1891, contains the following important papers: Modern Abdominal Surgery, by Sir T. Spencer Wells, Bart.; Subjective Noises in the Head and Ears: Their Etiology, Diagnosis, and Treatment, by H. Macnaughton Jones, M.D.; Notes on Surgery for Nurses, by Joseph Bell, M.D.; Surgical Treatment of Typhlitis, by Frederick Treves, F.R.C.S. \$10 a year; \$1 a number. New York: William Wood & Co.

THE NEW ENGLAND MEDICAL JOURNAL for September, 1891, signalizes its tenth anniversary by a galaxy of portraits of contributors to its pages, and others who have been among the foremost promoters of the science of medicine during the decade, of whose works the *Monthly* has been an exemplary chronicler. Better portraits and more of them, and continued prosperity to the WILE *Monthly* for future decades, is the hearty wish of THE SANITARIAN.

THE CLIMATOLOGIST, A MONTHLY JOURNAL OF MEDICINE, devoted to the Relation of Climate, Mineral Springs, Diet, Preventive Medicine, Race, Occupation, Life Insurance, and Sanitary Science to Disease. Edited by JOHN M. KEATING, M.D., FREDERICK A. PACKARD, M.D., CLARENCE F. GARDINER, M.D., and a corps of assistant editors large enough to start a good subscription-list to begin with. The first number, for August, 1891, consists of 82 pages, and is well gotten up. \$2 a year; 20 cents a number. Published by W. B. Saunders, Philadelphia, Pa.

From the first announcement of this periodical, several months ago, it appears to have been begotten on the Rocky Mountains, and, at the outset, its birthplace was expected to be at Colorado Springs. Whether it would not more speedily reach the high altitude at which it aims, by making its first appearance in a more fruitful field for medical periodicals, and one which would indicate a wider scope than Colorado Springs, has doubtless been the reason for its change of base. Anyhow, it is well equipped, and has an excellent prospectus:

“Devoted entirely to the promotion of the art and science of sanitation, mentally and physically, in all their relations; by the investigation, presentation and discussion of all subjects in this large domain, as related to personal and household hygiene, domicile, soil and climate, food and drink, mental and physical culture, habit and exercise, occupations, vital statistics, sanitary organizations and laws—in short, everything promotive of or in conflict with health, with the purpose of rendering sanitation a popular theme of study and universally practical.”

But this is an abstract from THE SANITARIAN'S prospectus, declaratory of its domain, nearly nineteen years ago. *The Climatologist's* announcement is only a more terse expression of the same domain, save that it gives special prominence to a few subjects which THE SANITARIAN has done more to render conspicuous than any other periodical extant. But for this THE SANITARIAN is all the more gratified by the appearance of *The Climatologist*. The prospectus of THE SANITARIAN now comprises subject-matter enough for a dozen periodicals. Nineteen years ago it scarcely commanded interest enough for one. People did not know enough about pre-

ventive medicine at that time to care to read about it. It was rarely the subject of discussion in medical periodicals, and in popular magazines not at all. How much THE SANITARIAN has had to do with popularizing the subject may be safely left to the consideration of its numerous progeny. The field is exhaustless, and THE SANITARIAN'S hope is that this newest and admirably equipped cultivator, and all the rest, may reap an abundant harvest.

The first number is an excellent one. It discusses Koch's Lymph, the Climate of Southern California, Bethlehem and Maplewood, Vaso-motor Paralysis in Influenza, Chorea in Relation to Climate, and the Contagiousness of Grippe.

THE JOURNAL OF BALNEOLOGY AND DIETARY, too, now in its third year, has already made gratifying progress in its circumscribed scope in the field of preventive medicine, as expressed by its title, in conjunction with balneo-therapeutics and climatology, which subjects, in common with the others enumerated in the prospectus above quoted, THE SANITARIAN was the first to open up. Its next issue, October number, will appear with a new editorial staff, consisting of DRs. A. N. BELL, FRANK WOODBURY, GEORGE H. ROHÉ—names sufficiently identified with the literature of the subject-matter to which the *Journal of Balneology and Dietary* is devoted to show the earnest of the projectors. The Journal of Balneology Publishing Co., P. O. Box 1670, New York.

VIS-MEDICATRIX : A BI-MONTHLY JOURNAL OF MEDICINE, HUMAN AND COMPARATIVE. The Journal of the Iowa State Medical Society. Edited by WOODS HUTCHINSON, A.M., M.D., L. H. PAMMEL, B.Agr., and S. STEWART, M.D., D.V.M., Associates. Fifty-five pages, 8vo. \$1 a year; 20 cents a number. Des Moines, Ia.

It begins well, has several excellent articles and society reports, and some excellent *puffery* ("Puffs from the Doctor's Segar"), of which the following is a specimen :

"I wonder what most people think 'out-doors' was intended for, anyway? To be avoided, one would think, judging from the way they appear to shun it on every possible occasion. The business man comes down to his hurried break-

fast, takes his carriage at the door, or the street-car as near the door as he can possibly get it ; hurries into his stuffy, half-lighted office, dashes out for thirty minutes at lunch time, packs himself into another air-tight receptacle for his homeward ride to dinner. After dinner he sits and smokes in his library or goes to a theatre, in either case spending the evening in air which has forgotten the feeling of sunshine, and whose very touch would make the leaves of the forest shudder and droop."

POST GRADUATE COURSE OF LECTURES.—Medical Faculty of University of Toronto is a pamphlet of seventy pages occupied with lectures on the Present Position of Antiseptic Surgery, by J. William White, M.D. ; Germs of Typhoid-Fever, by Victor C. Vaughan, M.D. ; Treatment of Typhoid-Fever, by J. E. Graham, M.D. ; Present Limitations of Spinal Surgery, by Robert Abbe, M.D. ; Some Typical Phenomena in Typhoid-Fever, by Alexander McPhedran, M.D. ; Typhoid-Fever, by William Oldright, M.D. ; Tubercular Disease of Bone, by A. Primrose, M.D. ; Tuberculosis in the Ends of the Long Bones, by B. E. McKenzie, M.D. ; and Surgical Tuberculosis, by George A. Peters, M.D. Toronto : J. E. Bryant Co.

THE BACTERIOLOGICAL WORLD announces its removal from the State University of Missouri, at Columbia, to Battle Creek, Mich., where the editor will be located as Director of the New Laboratory of Hygiene of the Battle Creek Sanitarium, and whence he will surely have to obtain his bacteria elsewhere, because the atmosphere of the Battle Creek Sanitarium is wholly uncongenial to them.

THE "JEW" QUESTION is up again ; this time in the form of a complaint by *The American Hebrew* against the publishers of the *Century* dictionary for its offensive definition of the word "Sheeny." Here is the opaque way in which the dictionary defines the word : "Sheeny (origin obscure), A sharp fellow, hence a Jew ; a term of opprobrium, also used attributively. (Slang.)" The phrase "origin obscure" is the awkward apology of the dictionary maker for not knowing anything about the word, and a complacent insinuation that

as the origin of the word was unknown to him, therefore it must be unknown to everybody else. His experimental guess at the meaning of it shows what a dictionary man can do with a word that he does not understand, "a sharp fellow, hence a Jew." Not the slightest etymological hint is given why "Sheeny" means a sharp fellow, nor why "sharp fellow" means a Jew. The insulting word is derived from *chien*, the French for dog, a pet name which for ages was given by the Christians to the Jews. In the gorgeous novel "Ivanhoe," the insulting epithet is freely given to the meek and long-suffering Isaac of York. Even that paragon of Christian chivalry, the haughty Templar, Brian de Bois Guilbert, can say nothing more courteous to Isaac than "Jew dog," and "Unbelieving dog." In the nations of the East "Sheeny" means a Christian, and the complimentary name by which an American or a European is saluted in Mohammedan countries is "Christian dog." Thus the law of retaliation travels round the world; and hate begets hate, and wrong begets wrong.—*The Open Court.*

MEMBERSHIP IN THE AMERICAN MEDICAL ASSOCIATION.

—This is obtainable at any time by a member of any State or local medical society which is entitled to send delegates to the Association. All that is necessary is for the applicant to write to the treasurer of the Association, Dr. Richard J. Dunglison, Lock Box 1274, Philadelphia, Pa., sending him a certificate or statement that he is in good standing in his own society, signed by the president and secretary of said society, with five dollars for annual dues. Attendance as a delegate at an annual meeting of the Association is not necessary in order to obtain membership. On receipt of the above amount the weekly journal of the Association will be forwarded regularly.

THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION will hold its seventeenth annual session at the Pickwick Theatre, Jefferson and Washington avenues, St. Louis, October 14th, 15th, and 16th. A full programme of interesting papers has been prepared, and provision has been made for the fullest, freest, and most complete discussion of the same. Representative men from various sections of the country have been invited to open the discussions.

The local profession of St. Louis is a unit to the end that every visiting physician shall be received in a regular warm-hearted St. Louis style.

The same qualifications for membership are requisite in this Association as for the American Medical Association, the former being subordinate to the latter. If eligible, you and your friends, together with your wives and families, are most cordially invited to visit St. Louis and enter into the scientific work and the social pleasures as you may desire.

I. N. LOVE, M.D.,

Chairman Committee Arrangements.

MEDICAL PRACTICE IN CONNECTICUT.—The following reply was sent to a doctor inquiring of a State official if he will be allowed to practise in Connecticut by registering his name and the college from which he was graduated :

"SIR: Anybody can practise medicine in Connecticut. You do not need to register; you do not need a medical diploma; you do not need to know the difference between opium and peppermint; you do not, indeed, need to know anything. You can simply come and live here and begin to practise. The laws of Connecticut will sustain you in collecting your fees for professional services, if you render any which you choose to call such. But if you undertake to carry me or my trunk to the depot for pay, you must get a license. If you peddle matches or peanuts, you must get a license. If you collect the swill from your neighbors to feed your pigs, you must get a license. If you want to empty your cesspool, you must get a license. But you can practise medicine in Connecticut *without a license.*"—*Hartford Post*, August 8th, 1891.

HOW TO REMOVE NITRATE OF SILVER 'STAINS FROM THE FINGERS.—A correspondent of the *Scientific American* gives the following harmless process :

First paint the blackened parts with tincture of iodine, let remain until the black becomes white. The skin will then be red, but by applying ammonia the iodine will be bleached, leaving white instead of black stains of nitrate of silver.

THE SANITARIAN.

OCTOBER, 1891.

NUMBER 263.

SIMPLE METHODS OF SEWAGE DISPOSAL.*

By C. W. CHANCELLOR, M.D., Secretary State Board of Health, Baltimore, Md.

AMONG the many problems engaging the attention of sanitary engineers, that which embraces the removal or disposal of household sewage is perhaps the most important. With the advance of natural sciences, the principles which are recognized as governing health and disease have been gradually developed, until we are now face to face with the fact that if we would be free from filth diseases, it is necessary to remove from our midst those elements which are either their direct cause or agents of transmission.

The question resolves itself into disposing of such matters in a manner best suited to the conditions and locality in which they are produced, having regard :

1. To the sanitary efficiency of the method employed.
2. To the economical attainment of the result aimed at ; and
3. To the method of disposal affording some return for the means expended.

The conclusions which naturally follow the foregoing propositions, and which, from a sanitary standpoint, dominate the whole question, may be summed up as follows :

(a) That wherever there is excretal refuse to be disposed of, it should be so treated as to remove or separate the solid from the liquid parts.

(b) That the impurities conveyed by the liquid parts of sewage, which are more readily oxidized, are insignificant as compared with those of the solid parts.

* Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, Washington, D. C., May 5th, 1891.

(c) That the solid parts of excretal sewage should never under any circumstances be allowed to enter a water-way ; and if the fluid parts can be subjected to some artificial process of purification, and subsequently passed through the soil by subsurface irrigation, so much the better.

These are fundamental axioms which require no discussion ; but it must be admitted that, thus far, serious difficulties have environed the practical application of these principles to the question of sewage disposal.

Apart from the question of health, the practice of discharging crude sewage into water-courses has its attendant evils. The solid matters will gravitate to the banks and bed of the stream, which not only obstructs natural drainage, but is liable to decompose and become offensive as the water falls, and exposes it to the action of the sun and air. Again, the more finely diffused solid particles are exceedingly hurtful to fish, choking up their gills and suffocating them. Moreover, fish breathe by means of the free oxygen which is contained in the water in which they natate, and this element being deprived of its oxygen by the admixture with sewage, the fish must necessarily die.

This fact alone, viewed in the light of political economy, should restrict the amount of sewage poured into any limited area of water ; for however admissible *fresh* sewage may be as food for fish, it soon becomes stale, and in this condition acts as a poison which will eventually destroy the fish and oysters of any water area into which it is discharged.

Again, when sewage passes into a putrefactive state, the gases that are generated either in sewer pipes or water-courses, are capable of producing certain malignant diseases ; but whether the illness is to be regarded as the direct effect of inhaling the mixed chemical gases, or as an expression of the consequences of inspiring a micro-organism which is reproduced in the human body, is not known to medical men—who are, however, perfectly familiar with the illness.

One of the greatest difficulties of adequately dealing with this sewage question lies in the enormous bulk to be operated upon—equal to about five gallons of water to every three ounces of fæcal matter—and it is therefore reasonable to suppose that, could some simple mechanical appliance be devised

by which the liquid could be drawn off and separated from the solid parts, it would greatly assist in the efficient treatment of excretal refuse. The fluid part need not necessarily be passed directly into a water-course ; it could be first distributed by subsurface irrigation over a sufficient area of land, for which it would serve as a useful manure, and by which it would be effectively filtered and still further purified. The employment of such a method is the more to be recommended because, when a process of separation only has been employed, as contradistinct from a process of precipitation with chemicals, the effluent is richer in organic substances available for the nutrition of plant life, and the solid matters being excluded, the pores of the soil will not become clogged.

As to the manurial value of the solid matters retained, that must be judged rather by the practical results of the agriculturist than by the presumed theoretical values based on analytical data. The percentage of combined nitrogen, however, in this material is remarkably constant, and the phosphoric acid which it contains is also an important ingredient in an agricultural point of view.

Fæcal matter has been termed "the natural food of the soil," as it returns to the soil those elements which are taken from it by the growth of vegetable products necessary for the proper nutrition of man. By treating excrementitious matters by a process of separation, moreover, what is now a nuisance to cities and towns may be made a source of profit to the country generally, especially to the agriculturist, who would find in the solid matters a valuable guano—superior to most manures in the market—produced at his own door.

"The most fertilizing and effective manure," says Victor Hugo, "is human manure ; but what is done with this golden dung ? It is swept into the gulf ! We send, at great expense, fleets of ships to collect at the Southern Pole the guano of petrels and penguins, and cast into the sea the incalculable element of wealth which we have under our own hands." *

If this so-called "golden dung" has the value that is ordinarily attached to it, private enterprise would surely be rewarded for its collection and utilization, and could well afford

* "Les Misérables," p. 290.

to pay a handsome bonus for its preservation. Agriculture, so important a factor in the country's industry and prosperity, has up to this time suffered such heavy losses from this material being "cast into the gulf," that, apart from the question of health, its interests are fully entitled to the serious consideration of political economists and legislative bodies.

It has been asserted that one prime cause of the fall of the Roman Empire was the building of the great sewers of Rome, and the consequent disastrous deflection of what might have been an enormous fertilizing material, into the Tiber, where it went to waste.

The Chinese are said to preserve carefully everything that can be used to enrich the earth for food production, and there seems to be a growing disposition, both in Europe and America, to follow their example, by devising measures and making experiments to utilize excretal refuse for enriching the soil; but we must admit that there is still a squandering of this valuable material that may well alarm the political scientist.

It is, undeniably, of the last importance that household sewage, which is now allowed to go to waste with a reckless disregard of both public health and agricultural prosperity, should be utilized in some cheap, cleanly and simple fashion; and surely, the ingenuity of man can be applied in no more useful way than to a proper solution of this important question, which embraces not only the welfare of society, but even the integrity of nations.

Passing by the difficulties which are unmistakably attendant upon the disposal of sewage in large quantities, the question comes up, how is it to be treated, as treated it must be, if the health of the inhabitants of our towns is to be considered? The methods of treatment, other than those involved in the systems by which the whole of the sewage is sent into water-courses—if, indeed, this may be considered a system of treatment at all—and in applying crude sewage for the irrigation of land, are pretty numerous; but numerous as they are, they all come under one or the other of the following classes:

1. Dealing with excretal refuse in a special way, altogether separate from large sewage drains, leaving these to conduct the waste waters of domestic and industrial operations and also the rain or storm waters alone.

2. The precipitating process, by which the solid organic and putrescible portions of the sewage are deposited in a solid form, which may be used as an ordinary manure, passing the liquid portion, in a condition more or less clear, into some stream or river.

3. Keeping the rain or storm water on the surface, or sending it into drains distinct from those conveying sewage, to be discharged into some river or stream; while the crude sewage, in a more concentrated form, is also passed into the water-course, or on the land for irrigation purposes.

4. A combination process of straining, precipitating and filtering, by which the solid part of the excreta is separated from the liquid, as it were, at the fountain-head, and retained in a hermetically closed vessel or tank, under a column of water, while the fluid parts, with the ordinary water of the closet, are passed through the meshes of a fine strainer, and then either run into the soil by subsurface irrigation, or filtered through some oxidizing agent, as burned or spongy iron, to be subsequently discharged on the surface of the ground, or into a water-course.

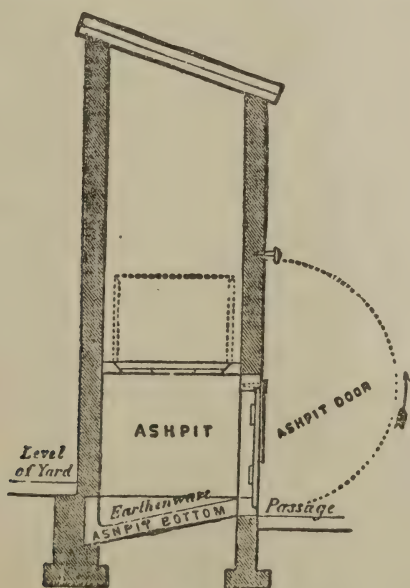


FIG. I.

Under the first of these four classes there are a number of arrangements which, when taken collectively, may be termed the dry system of collection.

The cess-pit and the midden were the first attempts at collecting excreta, not so much, however, for the purpose of profit as with the idea of preventing nuisance. The cess-pit need only be mentioned to be condemned. The ash-pit midden, or privy, has its advantages and its difficulties; of the difficulties, the education of the people to use them properly is chief—a difficulty, however, that applies quite as much to water-closets as to middens.

The general principle of the ash-pit midden, or privy system, is illustrated in Fig. 1. It consists of a common privy, with a small covered ash-pit, from the top of which a ventilating shaft is taken to the roof of the house to which it is attached. The floor of the ash-pit is of glazed earthenware, absolutely water-tight. The ashes used as an absorbent are emptied into the pit through the privy seat, whenever the closet is used. These pits are cleaned as often as may be necessary. This system is used at Hull, England.

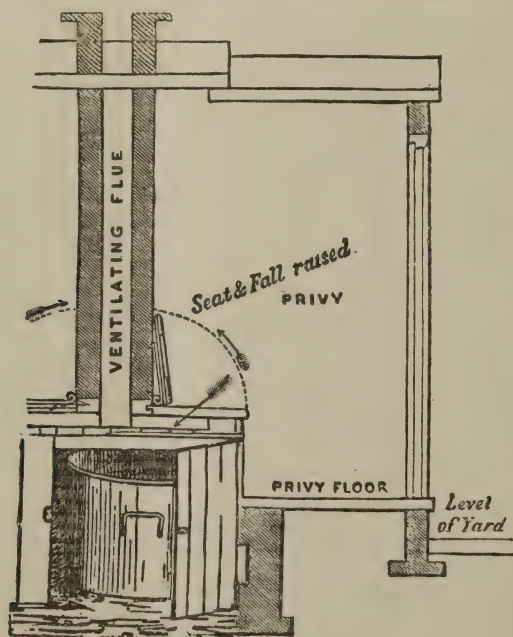


FIG. 2.

The Manchester method, Fig. 2, consists of a common privy, outside the house, constructed with a sunken pit, in which stands a galvanized iron receptacle, placed under the seat of the closet.

The floor of the pit is of earthenware, and the ventilation is through the flue, as shown in the illustration. The door for removing the receptacle is at the side or back. In the absence of the receptacle, the ash-pit can be used. The receptacle is emptied weekly.

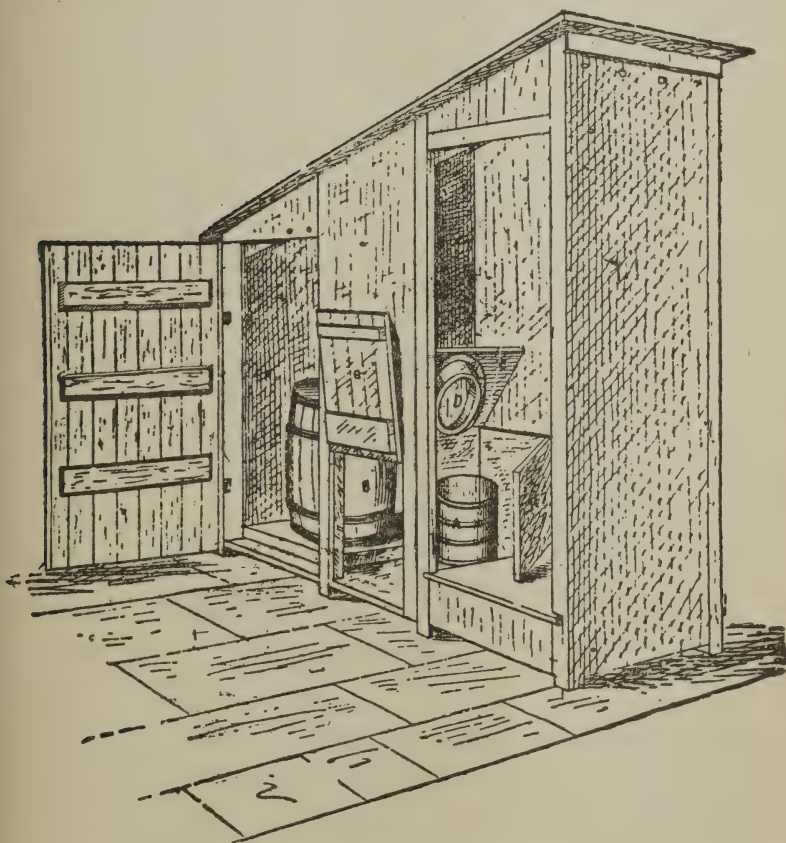


FIG. 3.—ROCHDALE PAIL CLOSET.

A, excrement pail. *B*, ash tub. *C*, seat cover (raised). *D*, iron collar below seat, reaching slightly into pail when cover is down. *E*, hinged upright of seat. *G*, door admitting from outside to excrement pail.

The Rochdale method is similar to the Manchester, except that the wooden pail, generally made from a kerosene barrel, is substituted for iron, and sits immediately beneath the closet seat and on the same level of the floor, instead of below the surface of the ground, which makes removal more difficult. Fig. 3 is an illustration of the Rochdale system.

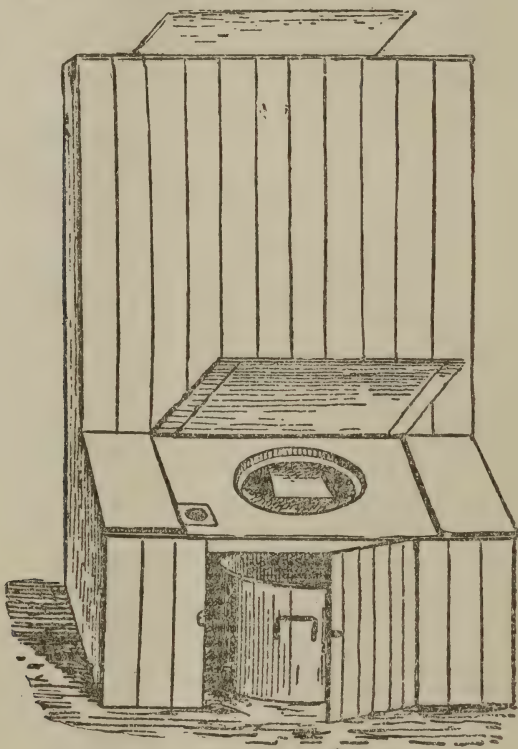


FIG. 4.—DRY EARTH CLOSET.

The Goux system consists in lining the inside of the tub with absorbents, as charred sea-weed or dry earth, rammed in by a central core, so as to give a uniform lining to the tub, thus preventing splashing. This method necessitates the frequent removal of the excreta. The faecal matter is received in the central cavity of the lining.

At Birmingham, where the galvanized pails are used to the extent of some 40,000, representing a population of 250,000, the contents are collected weekly. These are emptied into a

vat at the place of deposit, and some sulphuric acid added to fix the ammonia.

The object of these several methods is the conversion of the old and dangerous system of privy pits into receptacles calculated to promote health and decency, and keep out from sewers as much of the excremental matter as possible. There is no doubt whatever of the fact that either of these systems is infinitely more healthy and more reasonable in every way than the cesspool, and, personally, I am strongly inclined to think that a dry system of collection in villages and small towns, even if not in larger centres of population, is to be recommended in preference to the usual water-carriage system.

Lastly, we have among the dry systems of collection, Moule's dry earth closet, in which the deodorizing and absorbent power of the earth is applied to the treatment of excreta. This closet is illustrated in Fig. 4.

However efficient as a deodorizer and absorbent dry earth may be, there are almost insuperable difficulties attendant upon its use, which have retarded its general introduction, even in country districts. About four and one-half pounds of dry earth per head per day are required to obtain a consolidated and inoffensive compost. A village of 1000 persons would need, therefore, about two tons of dry earth per day. Moreover, it is a *sine qua non* that no liquids are to be discharged into the closet, so that it is a system which does not provide for liquid excreta; or if the air is very damp, which is the normal condition in certain places, or if the contents get moist in any way, we have, to all intents and purposes, a cesspool without its advantages, or without the special precautions that are commonly taken with regard to cesspools.

We come now to consider the precipitating processes. A great number of these have been tried, but the general result seems not to have been satisfactory, since none have thus far been free from a feature which practically condemns the whole of them—viz., the employment of expensive chemicals in large quantities for the purpose of precipitating from the water certain matters which are therein suspended.

The third plan is that by which the great dilution of sewage

with water is proposed to be avoided by having two distinct sets of drains, one to convey away the household sewage alone to some water-course, or to be treated by precipitation or subsurface irrigation; the other set of drains to carry off storm and street water. This was first proposed half a century ago by Mr. F. O. Ward, of England, and was subsequently practically carried out by Mr. Menzes, at Eaton, and, more recently, by Colonel George E. Waring, at Memphis. There can be no doubt that if the rainfall could be excluded from the sewage proper, a vast step would be gained toward the practicability of usefully applying sewage to the soil, but even then the area of land required would be so great and the cost of preparation so immense that the suggestion has been considered by high authorities to be hardly practicable. Moreover, it has been pretty well established that the putrefactive decomposition of solid excretal matter in soils gives rise to the production of malarial and parasitic diseases, and that such *solid* organic matters, after a time, will form a crust or cake upon and in the interstices of the soil, which gives off offensive and dangerous effluvia. Again, the subsoil water from broad irrigation is charged with decomposing matters; and Petenkofer is not alone in his opinion that "there is no more fruitful source of disease than polluted subsoil water which is constantly changing its level."

The mere fact that the available land near large cities, at least, is insufficient for the disposal of sewage by irrigation, is sufficiently condemnatory of the process as an exclusive means of utilizing sewage. According to M. Lefeldt, an acre of land is required for the excreta of every 20 or 30 persons when applied by broad irrigation; while Mr. Henry Robertson, of England, in a paper on sewage disposal (*Sanitary Record*, 1884), contributed to the Sanitary Institute meeting at Dublin (1884), states that "open porous land with a good free subsoil drained six feet deep, will deal, per acre, with the sewage of 600 people," but the cost of preparing the land he estimates at from \$4000 to \$5000 per acre, so that, practically, it does not much matter which kind of irrigation be used.

The theory of purification by irrigation is that the fluid part of sewage gradually percolates through the land, and is finally

carried off by the artificial under drains, while its organic constituents are subjected to oxidation by the agency of micro-organisms producing the phenomenon known as "nitrification." The solid parts left in the soil are also attached, and gradually succumb to the influence of hydration and oxidation ; but there is a limit to this process, and should the land become overcharged or choked with solid matters, which often occurs on sewage farms, oxidation will not proceed, and an intolerable nuisance ensues.

To prevent this the separation of the solids from the fluids of sewage is essential, and after this the effluent may be disposed of with entire immunity by a process of irrigation ; or, in the absence of special objections, the effluent may be discharged into a river or other water area having sufficient volume or flow to oxidize the organic matters which are held in solution. This, however, applies only to sewage, whether mixed with rain water or not, that has been so dealt with by screening, subsidence, precipitation or otherwise, that the solid parts are removed from the liquid parts.

If our boasted scientific knowledge is worth anything, it should enable us to separate the fluid from the solid parts of excretal sewage, and to convert the latter into a good practical manure, while the fluids may be discharged into the soil, or into some water-course, in an innocuous condition.

Some three or four years ago Mr. C. T. Kingzett, the distinguished London chemist, suggested that a small portable apparatus might be supplied to each house, provided with a strainer, whereby the water of crude sewage would be separated from the solid parts ; and the receivers could, by a properly organized system, be collected as often as necessary, and a clean one left in the place of the one removed. Such an apparatus, it scarce need be said, should be as simple and as economical as possible, consistently with preventing nuisance or danger to public health ; and I claim for a device which I have lately introduced, that it is at once the most simple, the most effective and the most economical that has yet been proposed for the purpose. The method consists of a process and apparatus by which the solid matters of household refuse are effectively separated from the water of crude sewage by mechanical straining, subsidence and precipitation,

whereby a large proportion of the suspended matters are detained in a hermetically closed receptacle, which when full can be removed and replaced with an empty one by a common laborer, while the liquid parts are continuously delivered in such a condition of purity, that they may be used to irrigate the soil with advantage, and without any danger of choking its pores ; or the effluent from the precipitating tank may be further purified by filtration through iron to such an extent that it can be discharged into any drain, sewer, cess-pit, river or stream with entire immunity. The apparatus is illustrated in the following diagram :

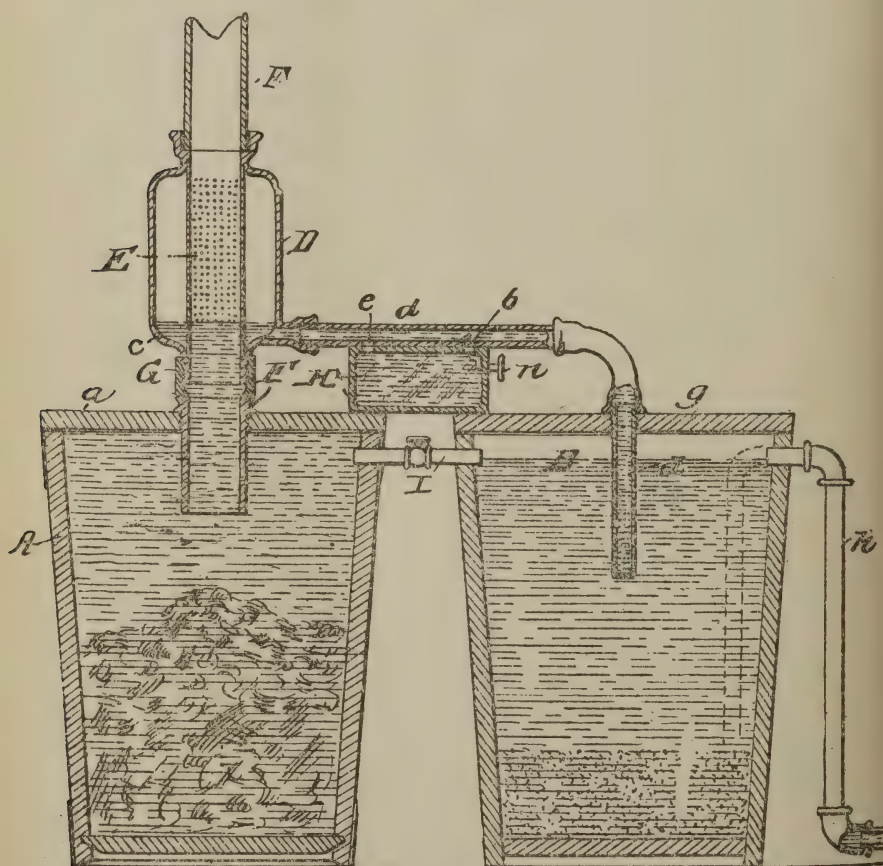


FIG. 5.

Fig. 5 represents a vertical section of the apparatus with all its parts intact, except the filter, which is omitted, as it is rarely to be used. *A* represents the receiving vessel or "receiver;" *B*, the settling or "precipitating tank;" *D*, the outer cylinder of the "strainers;" *E*, the inner perforated "strainer;" *FF*, the soil pipe connected with the strainer *E* above and below; *G*, the collar which connects the soil pipe with the receiver; *H*, the box or holder for the precipitating reagent; *I*, pipe connecting the receiver and precipitating tank for the purpose of drawing down the water to prevent slopping when the receiver *A* is detached at the cellar *G* to be removed. When detached the opening at *G* is closed with a close-fitting cap.

The operation of the apparatus is as follows: All such matters as are generally discharged into the soil pipes of houses are conveyed into the "receptacle," which is removably connected with the soil or drain pipe. The coarser, undissolved matters, such as foreign bodies, ordure, and paper not yet dissolved, which the trap of the soil pipe has allowed to pass, sink by gravity to the bottom of the receptacle, while the matters that are more or less dissolved in water find their way along with the supernatant liquid of the sewage through the meshes of the strainer, and from thence by a connecting pipe *D* into the precipitating tank.

The precipitating tank receives the overflow from the "receptacle" which has passed through the strainer. This tank is provided with an automatic device for discharging a certain quantity of chemical precipitants into its contents. The supernatant liquid in the precipitating tank, already quite pure, is discharged through the pipe *h*, which, when the effluent is to be disposed of by subsurface irrigation, is converted into a siphon simply, by extending this pipe downward, on the inside of the tank, to a point near the bottom. In this way the flush through the subsurface irrigation pipes becomes rapid and continuous until the tank is emptied.

The receivers, containing the solid parts of excretal matters, are to be collected, when full, by a properly organized system, and clean ones left in their places. These receivers should be taken directly to the usine or compost factory, where their contents may be worked up, with other sub-

stances, it may be, into an innocuous and valuable manure powder ready for immediate application to the soil. The utilization of the solid excreta is not, however (and this is a very important matter to public bodies which have to do with the disposal of sewage), confined in any sense to its employment as a manure, or as a source of ammonia and certain salts. It may be pressed, air-dried, and employed as ordinary fuel for use in boilers or other furnaces. Further, it may be ground up with clay and lime, and converted into brick or cement after the process devised by the late General Scott, of England ; or, again, it may be admixed with other materials, such as are ordinarily employed, and converted into a material for use in the construction of sidewalks, foundations of buildings, etc.—*Journal American Medical Association.*

THE DISINFECTION OF EXCRETA.*

By GEORGE M. STERNBERG, M.D., Lieutenant-Colonel and Surgeon U. S. A.

THE Committee on Disinfectants appointed by the American Public Health Association in 1884, in its final report, submitted in 1887, gives the following *general directions* :

Disinfection of Excreta, etc.—The infectious character of the dejections of patients suffering from cholera and from typhoid-fever is well established, and this is true of mild cases and of the earliest stages of these diseases as well as of severe and fatal cases. It is probable that epidemic dysentery, tuberculosis, and perhaps diphtheria, yellow-fever, scarlet-fever, and typhus-fever, may also be transmitted by means of the alvine discharges of the sick. It is, therefore, of the first importance that these should be disinfected. In cholera, diphtheria, yellow-fever, and scarlet-fever, all vomited material should also be looked upon as infectious. And in tuberculosis, diphtheria, scarlet-fever, and infectious pneumonia, the sputa of the sick should be disinfected or destroyed by fire. It seems advisable also to treat the urine of patients sick with an infectious disease with one of the disinfecting solutions below recommended.

* Read in the Section on State Medicine at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D.C., May, 1891.

Chloride of lime, or bleaching powder, is perhaps entitled to the first place for disinfecting excreta, on account of the rapidity of its action.

The following standard solution is recommended :

“ *Dissolve chloride of lime of the best quality,* in pure water, in the proportion of six ounces to the gallon.* Use one quart of this solution for the disinfection of each discharge in cholera, typhoid-fever, etc.† Mix well and leave in the vessel for at least one hour before throwing into privy vault or water-closet.

“ The same directions apply to the disinfection of vomited matters. Infected sputum should be discharged directly into a cup half full of the solution. A 5 per cent solution of carbolic acid may be used instead of the chloride of lime solution, the time of exposure to the action of the disinfectant being four hours.” (Op. cit., pp. 237, 238).

The object of this paper is to inquire whether these recommendations, which were based upon the experimental data available at the time they were made, are sustained by subsequent investigations ; and whether any other agents have been shown to possess superior advantages for the purpose in view.

But first we desire to call attention to another portion of the report of the Committee on Disinfectants. On page 236 the following definition of disinfection and disinfectants is given :

“ The object of disinfection is to prevent the extension of infectious diseases by destroying the specific infectious material which gives rise to them. This is accomplished by the use of disinfectants. There can be no partial disinfection of such material ; either its infecting power is destroyed or it is not. In the latter case there is a failure to disinfect. *Nor can there be any disinfection in the absence of infectious material.*”

* Good chloride of lime should contain at least 25 per cent of available chlorine (page 92). It may be purchased by the quantity at $3\frac{1}{2}$ cents per pound. The cost of the standard solution recommended is therefore but little more than a cent a gallon. A clear solution may be obtained by filtration or by decantation, but the insoluble sediment does no harm and this is an unnecessary refinement.

† For a very copious discharge use a larger quantity.

I have italicized the last sentence because I wish to call especial attention to it. I am frequently asked "what is the best disinfectant to put into a water-closet." Now if a closet or privy vault is resorted to only by healthy persons and no infectious material has been thrown into it there is nothing in it to disinfect, and the recommendation of the Committee on Disinfectants does not apply to it at all. It may smell badly, and in this case the bad odor may be neutralized by the use of deodorants; or we may prevent the putrefactive decomposition of its contents and thus prevent the formation of the offensive gases given off as a result of such decomposition, by the use of antiseptics. But to accomplish this it is not necessary to sterilize the entire contents by the use of active germicide agents.

A solution of sulphate of iron or of chloride of zinc is a useful antiseptic and deodorizing agent, and the Committee on Disinfectants in making its recommendations did not intend to discourage the use of such agents. But exact experimental data showed that these agents could not be depended upon for the destruction of infectious disease germs, and the recommendations made related to disinfection in the strict and proper use of the term as above defined. This definition is now accepted by sanitarians in all parts of the world, but many practising physicians still use the term disinfectant as synonymous with deodorant. For example, I find in a recent sanitary periodical under the heading "Medical Excerpt," an item copied from the *American Journal of Obstetrics*, to which the name of a distinguished gynecologist is attached, in which the following statement is made with reference to a much-advertised so-called "disinfectant." "As a disinfectant I have used it in my house for over a year with great satisfaction." Now the agent referred to has been proved by exact experiments to have comparatively little disinfecting power, although it is a very good deodorant. According to our definition "the object of disinfection is to prevent the extension of infectious diseases by destroying the specific infectious material which gives rise to them." Are we to suppose that the distinguished gynecologist above quoted had such infectious material in his house "for over a year" at the time he was employing "with great satisfaction" the agent he recom-

mends? If not, the term was improperly employed, for "there can be no disinfection in the absence of infectious material." I wish to emphasize this point because I have reason to believe that, in the army at least, the recommendation of the Committee on Disinfectants has led to the substitution of chloride of lime for cheaper deodorants and antiseptic agents—and especially for sulphate of iron—in latrines which are frequented only by healthy persons and consequently need no disinfection. The amount of chloride of lime issued from the Medical Purveying Depot, at San Francisco, during the past six months for use at military posts on the Pacific coast, is more than double the amount of sulphate of iron; but there has been no epidemic of an infectious disease, and probably comparatively little call for the use of a disinfecting agent in the sick-room. We quote again from the report of the Committee on Disinfectants :

"In the sick-room we have disease germs at an advantage, for we know where to find them as well as how to kill them. Having this knowledge, not to apply it would be criminal negligence, for our efforts to restrict the extension of infectious diseases must depend largely upon the proper use of disinfectants in the sick-room." (Op. cit., p. 237.)

"The injurious consequences which are likely to result from such misapprehension and misuse of the word disinfectant will be appreciated when it is known that recent researches have demonstrated that many of the agents which have been found useful as deodorizers or as antiseptics are entirely without value for the destruction of disease germs.

"This is true, for example, as regards the sulphate of iron or copperas, a salt which has been extensively used with the idea that it is a valuable disinfectant. As a matter of fact, sulphate of iron in saturated solution does not destroy the vitality of disease germs, or the infecting power of material containing them. This salt is, nevertheless, a very valuable antiseptic, and its low price makes it one of the most available agents for the arrest of putrefactive decomposition." (Op. cit., p. 237.)

Chloride of lime is also a valuable antiseptic and deodorant, and I know of no objection to substituting it for sulphate of iron other than the question of cost. The first cost of

chloride of lime, by the quantity, is about double that of sulphate of iron, but practically the difference is much greater because it is necessary to preserve the chloride of lime in air-tight packages. When exposed to the air it deteriorates in value very rapidly. It is therefore necessary to pack it in air-tight receptacles, which will not be injured by the corrosive action of free chlorine, and in comparatively small quantities, so that the contents of a package may be used soon after it is opened.

We now proceed to consider the experimental data relating to the germicide value of *chloride of lime*.

The Committee on Disinfectants gave it "the first place for disinfecting excreta on account of the rapidity of its action." This recommendation was upon experimental data obtained in the pathological laboratory of the Johns Hopkins University, under the writer's direction, and is sustained by more recent experiments made in Germany.

The experiments of Bolton, made for the Committee on Disinfectants in 1886, gave the following results: The time of exposure being two hours, the typhoid bacillus and cholera spirillum in bouillon cultures were killed by a solution containing one part to 1000 parts of water (containing 0.03 per cent of available chlorine). Anthrax spores were killed in the same time by a solution containing 0.3 per cent of available chlorine. Typhoid fæces were sterilized by a 2 per cent solution, and in several instances by a one half per cent solution, but some resistant spores of non-pathogenic bacilli survived in two experiments in which a solution of 1:100 was used. In bouillon cultures to which 10 per cent of dried egg albumen had been added, the typhoid bacillus was destroyed one half per cent (1:200).

Nissen, whose experiments were made in Koch's laboratory in 1890, found that anthrax spores were destroyed in 30 minutes by a 5 per cent solution, and in 70 minutes by a 1 per cent solution. In his experiments the typhoid bacillus and the cholera spirillum were destroyed with certainty in five minutes by a solution containing 0.12 per cent (1:833); the anthrax bacillus in one minute by 1:1000; staphylococcus pyogenes aureus in one minute by 1:500. Experiments made by the same author on the sterilization of fæces showed that

1 per cent could be relied upon to destroy the bacillus of typhoid-fever and the spirillum of cholera in fæces in 10 minutes.

Carbolic Acid.—The Committee on Disinfectants says: "A 5 per cent solution of carbolic acid may be used instead of the chloride of lime solution, the time of exposure to the action of the disinfectant being four hours." This recommendation is made in view of the fact that in those diseases in which it is most important to disinfect the excreta, the specific germ does not form spores. This is now believed to be true of the typhoid bacillus, the spirillum of cholera, the bacillus of diphtheria, the bacillus of glanders, and the streptococcus of erysipelas; and it has been shown by exact experiments that all of these pathogenic bacteria are destroyed in two hours by a 1 per cent solution, or less, of this agent.

Spores require for their destruction a stronger solution and a longer time. Koch found a 1 per cent solution to be without effect on anthrax spores after 15 days' exposure; a 2 per cent solution retarded their development, but did not destroy their vitality in seven days; a 3 per cent solution was effective in two days. According to Nocht, at a temperature of 37.50 C., anthrax spores are killed by a 5 per cent solution in three hours.

Carbolic acid possesses the advantage of not being neutralized by the substances found in excreta, or by the presence of albumen. Thus Bolton found that the addition of 10 per cent of dried albumen to a bouillon culture of the typhoid bacillus did not materially influence the result, the bacillus being destroyed in two hours by a 1 per cent solution.

This agent, then, is firmly established as a valuable disinfectant for excreta, but we still give the preference to the standard solution of chloride of lime of the Committee on Disinfectants for use in the sick-room, "on account of the rapidity of its action," and also on account of its comparative cheapness.

At the International Sanitary Conference of Rome (1885) the writer, who was associated with Dr. Koch on the Committee on Disinfectants, presented the claims of chloride of lime, and in the recommendations of the committee it was placed beside carbolic acid with the following direction:

“Carbolic acid and chloride of lime are to be used in aqueous solution.

“Weak solutions, carbolic acid, 2 per cent ; chloride of lime, 1 per cent.

“Strong solutions, carbolic acid, 5 per cent ; chloride of lime, 4 per cent.”

The strong solutions were to be used for the disinfection of excreta.

Creolin, a coal tar product, which is a syrupy, dark-brown fluid, with the odor of tar, has, during the past three years, received much attention from the German bacteriologists. It is probably the same product which was tested under the writer's direction for the Committee on Disinfectants, in 1885, under the name of “Little's soluble phenyle.” It stood at the head of the “Commercial Disinfectants” tested. The experiments made in Germany show that it is not so active for spores as carbolic acid, but that it very promptly kills known pathogenic bacteria, in the absence of spores, in solutions of 2 per cent or less. Eisenberg found that a solution of 2 per cent killed all test organisms within 15 minutes. Esmarch found it especially fatal to the cholera spirillum, which was killed by solutions of 1:1000 in 10 minutes. The typhoid bacillus showed much greater resisting power—a one half per cent solution failed after 10 minutes' exposure. The pus cocci were still more resistant. Behring has shown that the presence of albumen greatly diminishes its germicide power. As a deodorant it is superior to carbolic acid, and on this account is to be preferred in the sick-room. A recently prepared emulsion may be used to disinfect the liquid excreta of cholera or typhoid patients, in the proportion of 4 per cent, two hours' time being allowed for the action of the disinfectant. The experiments of Jaeger upon pure cultures of the tubercle bacillus attached to silk threads were successful in destroying the infecting power of these cultures, as tested by inoculation into the anterior chamber of the eye of a rabbit, when solutions of 2 per cent were used.

The value of this agent as a disinfectant is then fully established ; as to its cost in comparison with the agents heretofore mentioned I am not informed.

Quick-Lime.—Experiments made in Koch's laboratory in

1887 by Liboriws led him to place a high value upon recently burned quick-lime as a disinfectant. More recent experiments by Jaeger, Kitisato, Pfuhl, and others have shown that this agent has considerable germicide power, in the absence of spores, and that the value which has long been placed upon it for the treatment of excrementitious material in latrines, etc., and as a wash for exposed surfaces, is justified by the results of exact experiments made upon known pathogenic bacteria. The germicide power of lime is not interfered with by the presence of albuminous material, but is neutralized by phosphates, carbonates, and other bases, and by carbonic acid.

In the writer's experiments a saturated aqueous solution of calcium oxide failed to kill typhoid bacilli; but when suspended in water in the proportion of 1:40 by weight this bacillus was killed at the end of two hours. Anthrax spores were not killed in the same time by a lime wash containing 20 per cent by weight of pure calcium oxide. According to Kitisato the typhoid bacillus and the cholera spirillum in bouillon cultures are destroyed by the addition of 0.1 per cent of calcium oxide. Pfuhl experimented upon sterilized fæces to which pure cultures of the typhoid bacillus, or cholera spirillum were added. The liquid discharges of patients with typhoid-fever or diarrhœa were used for the purpose: He found that sterilization was effected at the end of two hours by adding fragments of calcium hydrate in the proportion of 6 per cent, and that 3 per cent was effective in six hours. When a milk of lime was used which could be thoroughly mixed with the dejecta the result was still more favorable. A standard preparation of milk of lime containing 20 per cent of calcium hydrate killed the typhoid bacillus and the cholera spirillum in one hour when added to liquid fæces in the proportion of 2 per cent.

The experiments with this agent show that time is an important factor, and that much longer exposures, as well as stronger solutions, are required to destroy pathogenic bacteria, than is the case with chloride of lime. For this reason we still give the last-named agent the preference for the disinfection of excreta in the sick-room. But in latrines the time required to accomplish disinfection is of less importance, and

we are disposed to give recently burned quick-lime the first place for the disinfection of excreta in privy vaults, or on the surface of the ground. It may be applied in the form of milk of lime, prepared by adding gradually eight parts, by weight of water, to one part of calcium hydrate. This must be freshly prepared, or protected from the air to prevent the formation of the inactive carbonate of lime.

According to Behring lime has about the same germicide value as the other caustic alkalies, and destroys the cholera spirillum and the bacillus of typhoid-fever, of diphtheria, and of glanders, after several hours' exposure, in the proportion of 50 cc. *normal-bauge* per litre. Wood ashes of lye of the same alkaline strength may therefore be substituted for quick-lime.

Finally, it must not be forgotten that we have a ready means of disinfecting excreta in the sick-room, or its vicinity, by the application of heat. Exact experiments made by the writer and others show that the thermal death-point of the following pathogenic bacteria, and of the kinds of virus mentioned is below 60° C. (140° F.): Spirillum of cholera, bacillus of anthrax, bacillus of typhoid-fever, bacillus of diphtheria, bacillus of glanders, diplococcus of pneumonia (*M. Pasteuri*), streptococcus of erysipelas, staphylococci of pus, micrococcus of gonorrhœa, vaccine virus, sheep-pox virus, hydrophobia virus. Ten minutes' exposure to the temperature mentioned may be relied upon for the disinfection of material containing any of these pathogenic organisms—except the anthrax bacillus when in the stage of spore formation. The use, therefore, of *boiling water in the proportion of three or four parts to one part of the material to be disinfected* may be safely recommended for such material. Or, better still, a 10 per cent solution of sulphate of iron or of chloride of zinc, at the boiling point, may be used in the same way (three parts to one). This will have a higher boiling point than water, and will serve at the same time as a deodorant. During an epidemic of cholera or typhoid-fever such a solution might be kept boiling in a proper receptacle in the vicinity of the hospital wards containing patients, and would serve to conveniently, promptly, and cheaply disinfect all excreta.—*Journal of American Medical Association.*

THE AMMONIA PROCESS OF WATER ANALYSIS.*

By REUBEN HAINES.

TWO forms of this process are in use, one dealing with a half litre or a full litre of the water ; the other requiring only 100 cc. for the distillation. The writer prefers the former, although some chemists find the latter fully as accurate and more convenient.

The following notes indicate the practice of the writer for a number of years, in addition to the instructions given by Wanklyn.

The amount of sample used is one-half litre, or, in some very impure waters, a less quantity of the sample diluted to half a litre with pure distilled water.

The retort is of large size, having a capacity of from one third to one half gallon when completely filled, and is supported at the neck by a large retort-clamp upon a heavy iron stand. It should not be supported on a ring, unless wire gauze be interposed, as otherwise there is great danger of fracture of the retort. If a Bunsen burner with wire gauze is used close up beneath the retort with such a body of liquid there is still danger of fracture.

The neck of the retort is inclined *upward* at an angle of about 25° and attached to a Liebig condenser having an inner tube of one inch diameter, by a short piece of wide rubber tubing in such manner that the ends of the retort and condenser are in close contact and that as little rubber as possible is exposed to the action of the hot vapor. In lieu of this arrangement a few inches of the end of the retort-neck may be bent downward parallel with the condenser, and be made to enter loosely within the glass condenser tube ; a short piece of rubber tubing overlapping the connection. In either case, the rubber should be tied down to prevent leakage, but

* Read at stated meeting of the Franklin Institute, Philadelphia, Pa., April 21st, 1891.

in such manner that the retort may readily be disconnected at the conclusion of the analysis. The rubber will have to be renewed after a time. The mode of connection recommended by Wanklyn has been shown by Drs. Smart, Mallet, and others, to permit loss of ammonia by leakage.

A rather rapid current of water should be maintained in the Liebig condenser. If this condenser alone is used, the current should be so rapid that the temperature of the water at the exit is not materially raised by the operation if the water used has an original temperature of from 50° to 60° F. If the water is of higher temperature than this ice should be used for cooling it. A better plan is that adopted by the writer, which consists in attaching the lower end of the Liebig condenser as closely as possible to a glass vertical coil condenser of the Mohr pattern, of which the outer vessel is an inverted jar receiver (a large inverted bottle with the bottom cut off will do very well), into which broken ice may be placed, especially in hot weather. The glass tube forming the coil has an inside diameter of about half an inch. Beneath this second condenser a short, nearly horizontal tube conducts the distillate to the Nessler glass out of reach of contaminating dust, etc., that might chance to fall from the vertical condenser.

By having the retort sufficiently large, and by inclining its neck upward, all danger of the permanganate being thrown over into the condenser is avoided. Risk of fracture is greatly lessened by the use of the retort clamp, and by the rod of the stand acting as a sort of spring to moderate the shock of bumping, and the retort may thus last in frequent use for a very long time. One of mine lasted several years, but it became unavoidably weakened in time by the corrosive action of the boiling alkaline liquid. By the above-described arrangement of the condensing apparatus, the distillate may be obtained at a given uniform temperature in all analyses in order to get uniform depths of color in the Nessler testing, a precaution to which some one has called attention. The risk of loss by imperfect condensation of ammonia during regular distillation, or through the outrush of gusts of vapor produced by turbulent boiling, is also avoided. The condensing tube should, on account of this latter circum-

stance, be of comparatively large diameter throughout its whole length. With the above arrangement I have not found any loss by imperfect condensation, if the temperature of the distillates did not exceed 60° F. If a lower temperature than this is adopted, the distillates should be allowed to stand until they acquire a uniform temperature before applying the Nessler test.

The arrangement I have adopted was suggested by reading the "Report on Water Analysis," by Professor Mallet, to the National Board of Health, 1882, in which this loss of ammonia occurring when Wanklyn's instructions are followed is referred to, and a somewhat different arrangement suggested for avoiding it. In experiments with a known solution of ammonium chloride this loss was found by Dr. Smart to amount to an average of about seven per cent of the whole amount that should have been obtained. It should, however, be noted that Mallet states that "the temperature of the condensing water varied from 25° to 25.5° C.," which is a rather high temperature. In these experiments the current of water in the condenser was so rapid that its temperature was not sensibly raised by the process, even when 50 cc. of distillate were obtained in eight minutes. The distillates of 50 cc. each are received directly into the Nessler tubes marked at 50 cc. and the earlier portions may be Nesslerized while the distillation is progressing. Wanklyn advises to Nesslerize only the first distillate of 50 cc. free NH_3 and add to this one third. In waters containing enormous amounts of free ammonia, however, it is better either to distil the whole of the free ammonia into a flask in one portion, dilute, and take an aliquot part for the Nessler test, or to follow Dr. Smart's plan of Nesslerizing each successive distillate of 50 cc., previously diluting if necessary. Dr. Smart believes that the presence of urea in the water may be detected by peculiarities in the manner in which the free ammonia distils over in the successive portions. I have found that polluted waters containing enormous amounts of free ammonia such as to give a very deep color or a precipitate by the Nessler test in 50 cc. of the original sample appear to yield four fifths or five sixths of the whole amount in the first portion of 50 cc. instead of three fourths, as stated by Wanklyn.

It is not advisable to put anything whatever, such as pieces of ignited pumice, tobacco pipe, etc., inside the retort to moderate the bumping, as suggested by some, there being too much danger of introducing thereby organic or ammoniacal impurity. The bumping can be controlled if necessary by lowering the flame and by tapping gently on the retort so as to produce a concentric wavy motion on the surface of the liquid, which will cause the steam to rise more regularly and in smaller bubbles. A Bunsen burner, giving a large flame, should be used. I prefer one having several jets, or a rose-burner, and place it quite close to the retort, without any intervening wire gauze.

¶ All the apparatus used for water analysis should be set aside exclusively for this purpose. Thorough washing of each article immediately before use is very essential. To be thought "clean enough" is by no means sufficient. The whole condensing apparatus set up ready for use, but disconnected from the retort, can be satisfactorily washed by flushing it thoroughly two or three times with clean hydrant water, closing the outlet by the finger or a clean cork until the condenser tube is full and then allowing the water to run out. This method of washing is much better than distilling some clean water through it, as advised by some. The retort should be rinsed with a little concentrated sulphuric acid and washed thoroughly with clean tap water, and then immediately connected with the condenser.

The above form of apparatus may be considered by some to be cumbrous and to occupy too much space; yet I think it possesses certain real advantages which offset these objections.

The alkaline permanganate solution can readily be prepared so pure that one litre of it undiluted yields by distillation not more than 0.005 milligrammes NH_3 and that no more ammonia develops in it afterward if properly protected. I have been using for more than ten years solutions prepared to this degree of purity, made up in quantities of one litre, which have kept well. The preparation is accomplished by using only very good distilled water for making up the solution, and by not permitting the sticks of caustic potash (ordinary white sticks) to come in contact with any kind of organic substance in handling and weighing it out. The mixed solution is

diluted to one and one-half litres and distilled in a large retort, slowly, until about 900 cc. remain, and then 50 cc. are tested with Nessler solution. If pure, the solution is transferred when cold to a litre flask and made up to the mark with perfectly pure distilled water, made free from ammonia and organic matter by distillation with some solution of alkaline permanganate of potash. I found that if river water from a hydrant was used in making the solution it was very difficult to obtain a solution perfectly free from ammonia, even after very protracted slow boiling. If an impure solution is used, and a correction applied for the impurity it contains, it will be found that the results of analysis are thereby subjected to error. I strongly suspect that errors from that cause did occur in some of my earliest analyses many years ago. Liability to error from this cause has been noticed also by others. Wanklyn, I think, never applied a correction for impurity, but always prepared the solution free from NH_3 , if I understand rightly a certain discussion which took place in the early history of the process. Yet Dr. Tidy, in 1879, declared the preparation of a solution of alkaline permanganate, free from ammonia, to be impossible, and said that he always had to make a correction for the ammonia he found it to contain. This was one of the several objections that were strongly urged against the ammonia process of analysis. On the other hand, Professor Mallet states, in his Report to the National Board of Health, 1882, that Dr. Smart in the investigations for that report made up his solution with good distilled water, and after the requisite boiling "it gave no coloration with Nessler reagent in 50 cc. distilled off from one-half litre."

Care should always be taken to rinse off the stoppered mouth of the bottle containing the permanganate solution both immediately before and after use, notwithstanding it may have been carefully protected from laboratory vapors, etc.

The rate at which both the free and albuminoid ammonia is evolved often affords valuable information as to the character of the organic matter contained in the water, and therefore the details of the separate Nessler testings should be preserved for reference. If, as sometimes happens, a peculiar odor is noticeable in the free ammonia distillate it may be presumed

to be due to the volatile organic matter which has passed over with the free ammonia, but which will probably not produce a reaction with the Nessler test solution and be lost to the analysis. In this case a second distillation with alkaline permanganate added at first should be made with a fresh portion of the sample, thus obtaining the total ammonia, the free and albuminoid coming over together. If the amount of total ammonia is sensibly larger than the sum of the free and albuminoid obtained in the first distillation, the difference may be assumed to be ammonia from volatile organic matter.

From my own experience during about eight years, in which I have very frequently repeated the distillation in the above manner, I am led to believe that the occurrence of a volatile organic substance in well waters is at least a comparatively rare circumstance. The test is, however, a useful check upon the accuracy of the analysis. The same proportions should be adhered to in the second as in the first distillation as regards the alkaline permanganate and the quantity of water operated upon.

Professor Remsen found, however, in 1881 a striking instance of the presence of volatile organic matter, which failed to be estimated by the ordinary method of procedure in his investigations into the water supply of Baltimore. Soon afterward Mr. Charles W. Marsh, then at Princeton, published a paper, in the *Amer. Chem. Journal*, giving a number of instances of similar nature in well and cistern waters which he had examined. The possibility of this occurrence should therefore be recognized and provision made for the estimation of the volatile organic substance.—*Journal of the Franklin Institute*, June, 1891.

THE DUTY OF THE GOVERNMENT IN THE PREVENTION OF TUBERCULOSIS.*

By LAWRENCE F. FLICK, M.D., Philadelphia, Pa.

WE read in the Declaration of Independence of the United States, " We hold these truths to be self-evident, that all men are created equal ; that they are endowed by their Creator

* Read in the Section of State Medicine, at the Forty-second Annual Meeting of the American Medical Association, held at Washington, D. C., May 5th, 1891.

with certain inalienable rights ; that among these are life, liberty, and the pursuit of happiness. That, to secure these rights, governments are instituted among men. . . ." All governments, indeed, which have been constituted upon the principles laid down in the great Magna Charta, have, as one of their foremost duties, the preservation of the lives and health of the people. The Common Law of England sums up the rights of individuals under three principal articles—namely : "The right of personal security, the right of personal liberty, and the right of private property ;" and defines the right of personal security to consist, "in a person's legal right and uninterrupted enjoyment of his life, his limbs, his health, and his reputation."

In the earlier days of civilization many diseases were looked upon as providential visitations, and therefore non-preventable. In the Common Law of England, however, the principle that the Government is bound to take every possible precaution against the spread of disease is well defined, not only indirectly by declaring for the preservation of life and health, but directly by providing penalties for persons offending against public health, or spreading such diseases as were then looked upon as contagious. The Common Law of England is operative in principle in most of the States of our Union ; and its provision for life and health are affirmed in the Constitution of probably most of the States. Section I. of the Constitution of Pennsylvania reads : "All men are born equally free and independent, and have certain inherent and indefeasable rights, among which are those of enjoying and defending life and liberty," etc. The words defending life must be given a broader interpretation than mere defence against the anger of a fellow-man. A reasonable interpretation makes it a defence against every danger to life for which the ingenuity of man has constructed a defence.

Modern science teaches us that many of the diseases, which were formerly looked upon as Divine visitations, are but ordinary warfares between various forms of organic life for self-existence ; and that when death ensues it is the going under of the weakest and the survival of the fittest. Man, the most perfect and the most intelligent of all of God's creatures, falls a victim to the onslaughts of organisms so minute that they

can only be seen by the aid of most powerful lenses. What these little warriors lack in size they make up in number, and in their great power of reproduction and multiplication. The organism of man, so perfect in its construction, so complex in its machinery, and so complete in its equipment for defensive warfare against parasitic vegetation, ought never to prove the weakest in a contest with organisms so primitive in construction as are disease germs. But the tiniest and the simplest organism becomes a power when acting in concert with a large enough number of organisms of its own kind. There is a law in Nature that the smaller and more primitive an organism, the more rapid its reproduction, and in pursuance of this law, disease germs, when they once gain entrance into proper soil, multiply so rapidly that the mechanical obstruction of their presence in itself becomes a menace. It is in this their great numbers that they become great and prove themselves the victors in the contest for survival.

Ever since man has inhabited the earth he has bethought himself of ways and means to escape and overcome disease. The accumulated thought and ingenuity of centuries has at last demonstrated to us how some diseases can at least be avoided. We now not only know that disease is mostly due to a living organism, but of some diseases we have learned enough about the organism that we can lay down pretty definite rules as to how to circumvent its development. We know what kind of soil it needs, how it is transplanted from person to person, or from persons to animals, and from animals to persons, what will readily destroy it outside of its host, how it is influenced by temperature and moisture, etc. We know, in fact, how we can prevent it from propagating any longer among us, and thus drive it entirely from our midst.

Of all diseases, the one concerning which we have this knowledge with the greatest accuracy is tuberculosis. So dreadful has been the onslaught of this disease upon the human family that* in all ages, from the days of Hippocrates down to the present, some of the brightest minds the world has produced have devoted themselves to the study of its cure and prevention. The question of its cure has not yet been satisfactorily solved, but that of its prevention has been made as clear as any problem in mathematics. We know positively

that the propagation of the disease germ depends upon the contamination of the well by the sick. We know also that this contamination can only take place in a certain way—namely, through the medium of broken-down tubercular tissue. We know, further, that the disease germ can very readily be destroyed in this broken-down tissue before it is able to reach a new host, and that if this is done the propagation of the disease will be stopped. The question of the prevention of tuberculosis, therefore, resolves itself into a question of how the broken-down tubercular tissue given off by hundreds of thousands of persons and animals, laboring under the disease, can be destroyed before it has an opportunity of reaching and infecting others. The practical solution of this question can only be accomplished by the government.

In most of the European governments, in harmony with their political institutions, there are National Boards of Health, with many dependent subordinate boards, to which is entrusted the care for the health of the people. Under our American form of government this system is not practicable; but we could have United States and State Boards of Health, which would act in harmony, and to each of which certain duties would naturally fall. There is no more reason why we should not have such Boards of Health than there is why we should not have United States and State Courts. We have State Boards of Health in most of the States, but we have none in the United States. Not only should we have a Department of Health in the United States, but it should be made compulsory on every State to have such a department. The contract between the people and the government cannot and will not be carried out until the machinery for such departments has been constructed and put into operation.

The duties which would fall to a United States Department of Health in the prevention of tuberculosis, and which cannot be performed by a State Department, are the prevention of the importation of the disease from foreign countries and the carrying of it from State to State by commerce and travel. No immigrants should be allowed to enter our ports who are suffering from tuberculosis. Where such have been carried, it should be seen that the ship which has carried them is properly disinfected, or at least that our own people be warned

against travelling in that ship unless it is so disinfected. A thorough system of disinfection should be practised under the supervision of the United States, on the coast vessels plying between North and South, all of which carry a large number of consumptives. All interstate railway travel should be kept under surveillance by the United States Government, and railway companies should be compelled to provide a complete system of disinfection of all apartments occupied by persons suffering from tuberculosis. The transportation of tuberculous animals or tuberculous meat should be entirely prohibited.

In addition to these duties for the prevention of tuberculosis, which are incumbent upon the United States, because they cannot be performed by the States, there are others in which the Federal Government is co-sharer with the State Government. The Constitution of the United States gives Congress power to "lay and collect taxes, duties, impost, and excises, to pay debts and provide for the common defence and general welfare of the United States. . . ." Under the power thus given the United States maintains an army and navy, and marine hospital service, army and navy hospitals, and educational institutions for the training of soldiers and sailors. Under the same power it could and ought to maintain a department of health, hospitals for the isolation and treatment of tuberculosis, and scientific institutions in which the disease could be studied and men given a practical training in methods of prevention. Our people have as much right to be protected against a disease which is known to be preventable as against a foreign foe.

To the State falls the lion's share of the duty in the prevention of tuberculosis. Every State in the Union should have a Department of Health, with subordinate departments in every county of the State. It ought to be the duty of this body to keep a record of every case of tuberculosis in the State, and of every movement of such case. Physicians ought, therefore, to be required to report every case of tuberculosis immediately upon discovery. When a case has been reported a competent officer of the State should at once be sent to the family to instruct them how to protect themselves against the disease. If they are too poor to supply them-

selves with the necessary means of self-protection, such means should be supplied to them, or they should be induced to remove the sick member to a special hospital for treatment. In order that sufficient opportunity be given for the tuberculous poor to be properly treated for the disease, the State ought to maintain well-equipped special hospitals in various parts of the State of convenient access. Whenever a case of tuberculosis removes from a house, or dies, the State should at once, before the house can be occupied by another, thoroughly disinfect every part of it, scrape and replaster the room which was occupied by the patient, and take precautions that none of the clothing or furniture which had been used by the patient be given away or left for the use of others without first having been thoroughly disinfected. A house thus cleansed should be so recorded in the office of the department, so that any one wishing to move into it may be able to first assure himself that he runs no risk.* The State should also forbid and restrain the sale of food contaminated with the disease germ of tuberculosis. All slaughter houses and dairies should be inspected by competent men, and all tuberculous meat, and tuberculous milch-cows be condemned and redeemed by the State. No persons suffering from tuberculosis should be allowed to follow any avocation, in which he can contaminate the food, the implements or the wearing apparel of another. To obviate any hardships, every person suffering from tuberculosis, who is compelled to support a family, or who has any one depending upon him, should for the time being become a pensioner of the State to the amount of his wages. Inasmuch as he gives up his earnings for the good of the public, it is but just and proper that he be supported as well as those depending upon him, at the expense of the public. I know that this will be cried down as expensive, and by some even as useless. That it would be expensive I admit ; but I cannot help but feel that our present knowledge of tuberculosis will satisfy every one who will take the trouble to study the question, and whose mind is not preoccupied by a pet theory of his own, that such preventive measures would wipe out the disease.

* For this thought I am indebted to my friend, J. V. P. Turner, Registrar of the Philadelphia Board of Health.

As regards the expense, the Government, both Federal and State, is not only justified, but is bound, by the very contract upon which it is based, to protect the people against preventable disease. All the purposes for which government is constituted may be briefly summed up under *life and its continuation for the allotted length of time without endangerment by violence or disease*. Every act of rational man is unconsciously tinted by a motive for unmolested existence. Our very physical construction is framed with this in view. Nature lets us suffer pain to indicate to us that life or limb is in danger. We have feelings of well being to show that all is right. All happiness, indeed, is dependent upon a feeling of security against danger to life for its existence. We seek to be at liberty, because we fear that restraint may prejudice our existence or that of those who are dear to us, or may place us in a position where at some time or at another we might not be able to protect ourselves or them. We seek to possess property in order that we can always supply the wants of nature to ourselves and those dependent upon us, and that we and they can refrain from exertions when our bodies need rest. In short, the pursuit of happiness may be tersely defined as the chase of the foes of life. The question of expense can, therefore, hardly be allowed to be brought forward as an argument against any preventive measures against tuberculosis. Whatever the expense might be, however, it would certainly be very small as compared to what would be saved to the people by an avoidance of the disease, even though the question of the preservation of life were left out. The return for the expenditure in the way of individual and public prosperity would amply compensate for the outlay.

It is estimated that 100,000 people die annually from tuberculosis in the United States.* It is well known that the largest number of victims are taken during the first half of ordinary life. Making a due allowance for the number who, being saved from tuberculosis, might fall a victim to accident or some non-preventable disease, it would, I think, be a fair estimate to assume that the average number of years of usefulness lost by each of these 100,000 people is ten years. We then lose every year by tuberculosis the earning capacity of

* Address on Phthisis Pulmonalis by William M. Collum, M.D., *Journal American Medical Association*, vol. 16, p. 361.

1,000,000 people for one year, which, put down in dollars and cents, at the low estimate of an average earning capacity for each individual of \$300 a year, would amount to \$300,000,000. Tuberculosis is, moreover, usually a chronic disease, and of long duration. At a very low estimate, the average length of time for which a tuberculous patient is incapacitated for work before death may be placed at six months, during which time the earning capacity of one other member of the family is at least crippled because of nursing and care required by the sick one. In this way the earning capacity of from 50,000 to 100,000 people more, for one year, is sacrificed and lost to public wealth. To the loss of time must be added the expenses incidental to sickness, which, if they averaged but \$50 for each sick person, would amount to \$5,000,000 a year. It will be very apparent to every one that I have placed all my estimates too low; but even with these low estimates, the annual loss to the public wealth of the United States because of the existence of tuberculosis will reach close on to \$500,000,000. The expenditure of one fifth of that amount by the Federal and State governments for the extermination of the disease would completely wipe out the disease in a single generation.

I am fully aware that there are men in the medical profession, and prominent men too, who still hold that tuberculosis is not a preventable disease, and who cry down any preventive measures on the part of the Government as a useless waste of public money. If there is any doubt on the part of the Government on this question, it is certainly its duty to appoint a commission to carefully examine into the question and clear up the doubt one way or another. Either tuberculosis is a preventable disease or it is not. If it is a preventable disease, the Government is in duty bound to prevent it, just as much as it is bound to protect its citizens against war. The finger of science points to the fact that tuberculosis is a preventable disease. Can our government afford to wait until every sceptic in the land has been convinced that it is preventable? No; its duty begins in the very beginning, with the scientific research into the preventability of the disease, and does not end until its citizens can walk this noble land for threescore and ten years, unmolested in health, life, and limb by aught that can be brought under the domain and control of man.—*Journal of American Medical Association.*

THE TRUTH ABOUT VACCINATION.

IV.

DR. BELL, in his reply to my article in *THE SANITARIAN* for May, seems to rest upon Dr. Abbott's contribution as a sufficient answer to my facts and arguments. He says that I fail "to face Dr. Abbott's statistical table of deaths from small-pox in different countries by age periods." In reply, I would say that the statistics I quote are equally as reliable as Dr. Abbott's, and prove my case as completely as his prove the case in favor of vaccination. In proof of my assertion that statistics have been manipulated to suit the purposes of advocates, I quoted from the published reports of the National Vaccine Establishment of England to prove that with every report they increased the annual death-rate from small-pox in pre-vaccination times, in order to make the results of vaccination appear more marked ; yet Dr. Bell says that "is equally irrelevant to the issue."

Again, I hold that the statistics of Van Sweiten and others which I quoted are equally as reliable as any of the early statistics on the subject offered by the other side, and I simply said that I was willing to drop them as well as all others of that period.

It seems to me a weak position to assume, as Dr. Bell does, that small-pox existed in London "for many centuries" before the period I name (1629), but that it "was not generally distinguished from plague and measles." What right has he to assume this in face of the fact that nowhere can he find anything on which to base his assumption ?

Now let us see how Dr. Bell figures out his percentages of the small-pox epidemic at Marseilles in 1825. (See *THE SANITARIAN*, May, 1891, pp. 459, 460.) Of the 3000 vaccinated in the city, 2000, or two thirds, contracted the disease, and not one fifteenth, as Dr. Bell states. Again, the number of deaths among the vaccinated was 1 out of 150, and not "one out of every fifteen hundred," as Dr. Bell figures it—*i.e.*, of an equal number of variolated and vaccinated persons,

$3\frac{1}{3}$ of the vaccinated to 1 of the variolated died. Is it not a remarkable coincident that in an arithmetical calculation like this Dr. Bell should make an error of 1000 per cent in favor of vaccination? But this is not all. The comparison is made on a population of 40,000. How, then, does the doctor get his 8000 on which to base his calculation? Will he tell us from what part of the population does he select this number? If there were only 3000 vaccinated and only 2000 who had before had small-pox, there must have been a balance of 35,000 of the population who had not been vaccinated. Then only 4000 of this number contracted the disease, and 1000 died. This would give one eighth of the unvaccinated against two thirds of the vaccinated contracting small-pox; and 1 out of 35 of the unvaccinated as against 1 out of 150 of the vaccinated who died. While these correct figures show that the unvaccinated were less subject to the small-pox than the vaccinated, they indicate, other things being equal, a much lower mortality among the vaccinated. But other things were not equal. The persons vaccinated at that time were the better fed and better housed part of the population. The sickly and delicate were not vaccinated, neither were the poor, who always fall the ready victims of any epidemic.

If it be true that [vaccination never fails except when the operation is imperfectly performed, then the profession must be very ignorant not to have become expert in so simple an operation after nearly a hundred years' experience. Again, if small-pox is not influenced by sanitation, as Dr. Bell has previously asserted, why not depend on vaccination alone to wipe out the disease? Why resort to quarantine, isolation, and disinfection, without giving these auxiliaries any credit for the decline of small-pox? I claim that no proof of the prophylactic value of vaccination has ever been or ever can be adduced till its value is proved by depending on it alone in a small-pox epidemic.

Professor Lawson Tait, the celebrated English surgeon and scientist, does not agree with Dr. Bell regarding the value of sanitary measures in stamping out small-pox. In a paper read before the Birmingham Philosophical Society, April 20th, 1882, he says: "The real agent for the stamping out of small-pox is the machinery of a system of sanitary police,

such as we have here, and even on the small scale for which we have had it for six years it has worked marvels. It will stamp out not only small-pox, but every other zymotic at the same time and by the same measures, and then we need not trouble about vaccination. . . . When it begins to dawn on the mind of the British public that all these diseases, both for man and animals, are absolutely preventible by the simple means of securing fresh air, pure water, and abundant light, they will be banished."

In striking contrast with the claims of the vaccinists, and in conformity with the views of Professor Tait, we note the results obtained in Leicester, England, by the anti-vaccinists. Mr. J. F. Biggs, of Leicester, who has recently given his testimony before the Royal Commission, writes to the *Lynn (Eng.) News* of May 30th, as follows :

" In 1868-72 Leicester was better vaccinated than at any previous period of its history—no fewer than 87 per cent of the total births being vaccinated. At that time our small-pox death-rate was an average annual of 773 per 1,000,000. Vaccination has now fallen to about 3.6 per cent, but we have had no small-pox deaths for eight years.

" To what is this due? Certainly not because we have not had small-pox in the town, for since the subsidence of the great epidemic of 1871-73 we have had no less than 32 importations of small-pox from the efficiently vaccinated towns and cities of Nottingham, Birmingham, London, and Sheffield—principally from the latter. The whole of these 32 importations, which led to 114 cases of small-pox, have been successfully stamped out by the 'Leicester method' of isolation, disinfection, quarantine, and general sanitation, without recourse to vaccination. From 1884-88 we had 15 importations and 46 cases of small-pox, all of which were cured, there being no deaths. If the practice of vaccination had continued in full swing, as in 1868-72, Leicester would have spent £1820 in vaccination. The cost of quarantine, etc., was only about £170, showing a saving between the two systems in five years of £1650.

" All the towns which profess to rely upon vaccination now fall back upon the 'Leicester method,' so that the cost of vaccination is entirely thrown away.

“ We find small-pox very easy to deal with, and the same hospital and staff of officials deal with small-pox as with other infectious diseases. There is no compulsion. If people choose they go into quarantine, or they may stay out. No one's liberty is infringed. We have one horse and ambulance van, which is kept for other diseases, whether there is any small-pox or not. No extra expenditure is incurred excepting the cost of the patients, or those who choose to go into quarantine, as given above. Our death-rate has fallen from about 27 per 1000 in vaccination times to 17 per 1000 in these non-vaccination days. The sooner Lynn adopts and sticks to the Leicester system the better for its pocket and its health.”

Here we have the result of a rational method of dealing with small-pox in the same way as with other contagious diseases, and the figures need no manipulating to show the result. Let this method be adopted elsewhere, without vaccination, and the result will be the same. We contend that these Leicester figures more than offset the statistics furnished by C. A. Siegfried, M.D., which give results under widely different conditions, which are consequently valueless, even if the figures corresponded with others from different sources, which they do not.

Dr. Abbott deliberately insinuated that I falsely quoted from the Registrar-General's Report for 1883 (46th), and though I called his attention to the numbers of the tables and pages of the report, he has in no way acknowledged his error. Neither has he acknowledged the incorrectness of his statement regarding the publication of Dr. Creighton's article on vaccination in the *Encyclopædia Britannica*. I now ask Dr. Bell to do me the justice to acknowledge that I did not misquote from the above-mentioned report, and I also ask him, in the interest of fair play and honest dealing between gentlemen, to write to the publishers of the *Encyclopædia Britannica* for a true history of the article on Vaccination in their ninth edition, and publish their answer for the benefit of the readers of THE SANITARIAN.

Dr. Bell further asserts that the medical profession is not divided in regard to the efficacy of vaccination. As I stated in my last article, the advocates of the bovine virus in England are as much opposed to the use of humanized virus as

they are to the anti-vaccinists. In fact, they assert that vaccination has completely failed because the virus in general use has been inoperative. This is the same argument as Dr. Bell uses when he says that if a vaccinated person takes small-pox it is "due to the imperfect performance of the operation." I know scores of physicians who still claim that one efficient vaccination in infancy protects for life against small-pox. The virus which Jenner claimed to be the only preventive against small-pox is not now used in any country in the world, while that which is used in America was derived from the spontaneous cow-pox which Jenner and his disciples declared could not protect against small-pox.

Among the opponents of vaccination are numbered many of the leading physicians and scientists of Europe and America, whose names and opinions I will give in my next article.

Dr. Bell concludes his last article with these words: "*It is the most generally accepted truth the medical profession ever enunciated.*" We would remind the doctor of the universal practice of blood-letting, which was taught and practised in his day [and mine, but which was forced out of use by an enlightened public opinion which originated with a few "cranks." Where one person disbelieved in vaccination ten years ago five hundred disbelieve in it to-day, and with a more general knowledge of the teachings of such men as Lawson Tait, and the adoption of the methods of Leicester for the prevention of small-pox, it will not be ten years more before vaccination will be relegated to its true position—among the superstitions of the past.

ROBERT A. GUNN, M.D.

DR. BELL'S REPLY.

DR. GUNN's apparent inability to quote correctly Dr. Bell's statement, made only six months ago, in May number of THE SANITARIAN, p. 460, why all unvaccinated persons do not take small-pox, is a pretty good index of the frailty of his memory, or of his disposition to pervert the import of a clearly stated proposition, which, for the benefit of any one who may read this and may not have read that, is here repeated :

To Dr. Gunn's inquiry : " If the unvaccinated are in a constant state of receptivity, why do they not all take small-pox and die ; and why do not the vaccinated escape entirely . . . ? " I replied : . . . That all vaccinated persons do not escape smallpox is, for the most part, due to the imperfect performance of the operation and the changes which take place in the growing organism from infancy to full maturity, which render *revaccination* necessary."

Dr. Gunn had urged, as he continues to urge, contrary to the literature of the subject, that the votaries of vaccination, from the beginning and to the present time, pinned their faith to a single vaccination as being all that was necessary ; and in addition to that which is above reproduced, I cited Bousquet's treatise, published in 1825, only two years after Jenner's death, to show that such a belief was not entertained by practical observers even at that time. Yet Dr. Gunn perverts my statement by implying that I endeavor to maintain the *untruth* which he represents by asking :

" If it be true that vaccination never fails except when the operation is imperfectly performed," etc., as if I or any other person familiar with the history of vaccination had ever said that it was.

And with regard to Bousquet's statistics, he endeavors to divert attention from the purpose for which they were cited, by asserting that the unvaccinated at that time were less subject to small-pox than the vaccinated, despite the evidence to the contrary, even according to his own construction of the statistics.

It is difficult to believe that Dr. Gunn is so devoid of the knowledge of the truth about vaccination, as made known through the most authentic sources of information during the last fifty years—since it has been a special subject of elucidation by the votaries of preventive medicine everywhere—as to ignore such knowledge. Yet there appears to be no other way to account for his persistence in clinging to the views of Van Sweiten and others, who wrote about it three quarters of a century or more ago, and to the long since exploded fallacy which he still entertains with regard to the relations of filth to disease, and to small-pox in particular, which he persists in discussing.

Again, in reply to the garbled statistics which he adduced in his first communication, which he still harps upon, I submitted a brief abstract of *official* statistics, civil and military, registered by officers of the highest repute, which statistics, in his second communication, he essays to discredit because they *are* official ! And he endeavors to make it appear that sanitary officers in the civil and military services of the most enlightened communities in the world are enlisted in the prostitution of their offices to the support of the protective power of vaccination because they are in public employ and paid for their services. And so, too, with regard to Dr. Abbott's statistics and what he said of Dr. Creighton's contribution to the *Encyclopædia Britannica*, quoted from the London *Lancet*, that it is a piece of "pathological transcendentalism," and that its author "has no claim to be considered an authority on practical medicine."

It would have been an easy matter for Dr. Abbott to have gone farther and shown that, according to the following abstract of Dr. Creighton's evidence before the Royal Commission appointed to inquire into the subject of vaccination (Second Report), that the *Lancet's* estimate is abundantly justified by Dr. Creighton's own testimony, as illustrated by his replies to the following questions :

"5112. Suppose that vaccination was not the absolutely complete protection that was supposed, might the case still not be a good one for vaccination? Historically it was a question of absolute protection or none ; the plea of partial protection arose at a much later date ; and, as I am dealing with the case historically, it was either 'protect' or 'not protect.'

"5113. That is to say, that at that early time of vaccination the suggestion made in cases of failure was that there must have been wrong vaccine used ; but does that prove anything more than that those who first introduced the matter to public attention may have overestimated the value of the discovery which they had made? They attempted to account for every single case of failure down, I think, to about the year 1825.

"5114. But is it an uncommon thing, in the history of discoveries or inventions, that those who first discover or in-

vent anticipate results greatly in excess of those which experience proves are derived from them, even though they are valuable discoveries or inventions? As it appeared to Jenner and his contemporaries, there was no third course; it was either hit or miss; that is clearly stated by Dunning.

“5115. Does that imply more than that they were mistaken? That position was departed from later on, I admit; they may have been mistaken; but I am not going to endorse the statement that they were mistaken.

“ . . . 5120. Then, supposing experience to have shown that, although that certain of those who were vaccinated took small-pox, yet, nevertheless, the vaccinated took it in less proportion than the unvaccinated—supposing that to be established, how would that be affected by the fact that those who first discovered small-pox imagined that nobody could take small-pox who had been vaccinated? I must keep within my historical lines. I have statistics to put in from contemporary experience. I am dealing with the facts as they presented themselves to the first vaccinators, and with the facts upon which the assent of the profession was given to the practice as early as 1800 or 1802.

“ . . . 5125. Do you think upon these early facts to which you allude, that the conclusion would be justified that vaccination was an illusion, without an examination of the facts which experience has furnished us with during the many years that vaccination has been in operation? No, I do not; and, personally, before I came to a conclusion in the matter, I examined the statistical evidence also.

“5126. And, as I understand it, drew your conclusion from the early history of vaccination that it is a delusion and an imposture which has been fostered by the medical profession, and which has no other foundation? I suppose the reference is to page 352, where I say: ‘The anti-vaccinists are those who have found some motive for scrutinizing the evidence, generally the very human motive of vaccinal injuries or fatalities in their own families or those of their neighbors. Whatever their motive, they have scrutinized the evidence to some purpose; they have mastered nearly the whole case; they have knocked the bottom out of a grotesque superstition.’ I

put it upon the anti-vaccinists, and give reference to their writings."

Further on, with reference to the article in the *Encyclopædia Britannica* :

" 5399. In your article you gave a table at page 28 of the deaths from small-pox from 1847-84 ; do you remember with what object you gave that table ? I really had no other object than to put in something that would be probably wanted by those who used the article.

" 5400. But do you not think that that table is very incomplete without a statement of the population at the different periods ? That is so familiar to every one that they make their own allowances for it.

" 5401. But do you not think that it might mislead some one with regard to the relative mortality of small-pox in different years if you do not give at the same time the increase in the population ? Do you know that Mr. Picton has quoted this table in an article which he wrote in, I think, the *Contemporary Review* ? There is nothing misleading in the table so far as I can see.

" 5402. You do not think it is misleading not to put the population ? No ; I deliberately chose actual numbers instead of ratios throughout as being more concrete.

" . . . 5405. Do you mean to say that a thousand deaths from small-pox in a population of a thousand, and a thousand deaths from small-pox in a population of thirty millions would mean the same thing and point to the same conclusion ? No, not at all. I chose the actual numbers not with any intention of magnifying the amount of small-pox, or giving any color to the facts one way or the other, but throughout the article I took actual numbers instead of ratios, because they appear to me to be more easily apprehended by those who read. If you speak of a ratio per million living, in my experience it makes no impression.

" 5406. That may be quite true ; but if you give the actual numbers, ought you not give the actual numbers of the population, too ? because that, supposing that the number of deaths remain constant, while the population is constantly increasing, does not that show a diminishing of the disease ? The correction, it appears to me, can be easily made by most of

us, because we are familiar with the increase of the population.

“ 5407. But the unlettered and unlearned people who would be misled by ratios, would they be likely, necessarily, to have in their minds variations of population in order to make the necessary correction? I think the population might have been introduced to advantage, so as to prevent the error.”

Dr. Gunn's attitude is evidently of a piece with Dr. Creighton's, upon whom he relies as his leading support. Clearly, therefore, if he thinks he can show Dr. Creighton to better advantage than he has shown himself in the above-quoted evidence, it is Dr. Gunn's part, and not Dr. Abbott's nor mine to seek it; though I am quite sure neither Dr. Abbott nor myself would knowingly do Dr. Gunn an injustice.

Of like nature with Dr. Creighton's testimony is Dr. Gunn's insistence upon his reference to the reports of the National Vaccine Establishment from 1808-36, which is decidedly favorable to the protective power of vaccination even then, as they have ever been since. But in the continued recurrence of epidemics of greater or less severity in various places during that period, because vaccination was practised to a very limited extent, by taking the excess of deaths in some of the latter years—without reference to the increase of population *à la* Creighton—he would have the reader believe the increased severity was not only despite of, but promoted by vaccination—as he has endeavored to show that the epidemic in Marseilles was in 1825.

And as to the evidence of one Mr. Biggs, with whose statement, quoted from a newspaper—Dr. Gunn would dispose of Dr. Siegfried's comparative statistics of vaccinated and unvaccinated populations of European cities—that “ All the towns which profess to rely upon vaccination now fall back upon the ‘ Leicester method,’ ”—implying that the sanitary authorities have lost faith in vaccination—the statement is so palpably false as to merit no reply.

A. N. BELL, M.D.

THE INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY, HELD IN LONDON, AU- GUST 10TH-15TH, 17TH, 1891.

(From the *Medical Record*.)

FIRST DAY, MONDAY, AUGUST 10TH.

THE opening meeting of the Congress was held in the afternoon in St. James's Hall. About two thousand persons were present. Sir Douglas Galton presented the Report of the Permanent International Committee. The Prince of Wales, President of the Congress, then gave a short address in which he tendered a hearty greeting to all the members.

Speeches were then made by the following foreign members of the Congress on behalf of the countries they represented—viz., Dr. Brouardel (France), Dr. Van Coler (Prussia), Professor Corradi (Italy), Dr. Roth (Germany), and Professor Körösi (Austria-Hungary). Sir James Paget then moved a vote of thanks to the Prince of Wales for having accepted the office of President, and for the manner in which he had conducted the business of the day. This was seconded and carried unanimously.

SECOND DAY, TUESDAY, AUGUST 11TH.

SECTION ON PREVENTIVE MEDICINE.

ADVANCE IN PREVENTIVE MEDICINE.—Sir Joseph Fayrer presided and gave an interesting introductory address. He spoke of the present aspects of preventive medicine, its recent development, and of how the public mind was becoming gradually imbued with the conviction that prevention was better than cure, and often easier. The advance in preventive medicine had been most remarkable during the last half of the present century. It was now pretty generally understood that about one fourth of all the mortality in England was caused by preventable disease, that the death-rate of large communities might be reduced much below that at which it was wont to stand, that the average duration of life might be made to approximate near to the allotted fourscore, and that

the conditions of living might be greatly ameliorated. Certain well-known diseases were less severe now, if not less frequent. The death-rates from small-pox, enteric-fever, typhus, and scarlatina, had declined of late years; that from diphtheria had increased, showing, perhaps, that the disease was now better differentiated from scarlatina. Dr. Buchanan, in England, and Dr. Bowditch, of Massachusetts, had both showed that there was a striking parallelism between the diminution of the death-rate from phthisis and the drying of the soil resulting from the construction of sewerage works. Preventable disease still killed in England about 125,000 yearly, and it had been calculated that 78,250,000 days of labor were lost annually from preventable sickness, which meant \$39,000,000 per annum. It was not to be expected that we could exterminate zymotic disease altogether, but we could diminish its incidence. The speaker was inclined to give a very wide scope to preventive medicine. The records of the past fifty years proved the influence exerted by sanitary measures on vital statistics. The beneficial results of sanitary work were also well illustrated in India. In preventive as in curative medicine, knowledge of causation was essential, and recent advances in physiology, chemistry, histology, and pharmacology had done much to throw light on the nature and causes of, and also on the means of preventing or of dealing with disease. The study of bacteriology was opening out sources from which might flow results of incalculable importance in their bearing on life and health.

THE MODE OF PREVENTING THE SPREAD OF EPIDEMIC DISEASE FROM ONE COUNTRY TO ANOTHER.—Surgeon-General Cunningham then read a paper on this subject. Taking cholera as the type of epidemic disease, he said we had three well-recognized methods of preventing its spread from country to country—viz. : 1, Quarantine; 2, medical inspection; 3, sanitary improvement. Land-quarantine was impracticable, and sea-quarantine had done no good. The liability of the inhabitants of Malta to all epidemics was a good example of the failure of sea-quarantine to effect practical results. Medical inspection of those entering a port was of some merit, and certainly the sick benefited by it, but the third method was the only one of real service.

THE TRANSMISSION OF CHOLERA FROM ONE COUNTRY TO ANOTHER.—Inspector-General Lawson read a paper on the above subject. He said there had been, and still remained, a most serious error in assuming that personal communication was so powerful a factor as many believed. The speaker related three instances which had occurred of late years, of the outbreak of malignant cholera at points in advance of those which the disease had already reached in the epidemic form. These instances showed that the efficient factor of cholera could be conveyed by atmospheric currents, from where it was already prevailing to localities at a great distance, in sufficient quantity to generate an epidemic. Cholera, therefore, could not be excluded from any country by quarantine, and all that could be done was by hygienic measures to improve the health of the population, and to remove the conditions favoring the formation of foci.

AUSTRALIAN QUARANTINE.—Dr. Ashburton Thompson read a paper on this subject. The views accepted in Australia, he said, were based on the resolutions passed at the Australasian Sanitary Conference held at Sydney in 1884. Medical inspection was the outcome of England's local conditions, was exactly suited to them, and therefore not necessarily suitable where local conditions differed from England's. The degree of protection which quarantine could afford varied inversely with the ease of communication between the infected country and the country to be defended. Quarantine could yield protection commensurate with its cost only in countries whose internal sanitation was good, and its function was not to exclude infection, but to lessen the entering number of the foci of infection. The author then proceeded to point out that nations whose internal sanitary organization was not perfect could not afford to refer the observation of suspects to the country at large. Consequently, limited quarantine should be employed against ships actually carrying cases of exotic disease—that is, vessels and equipment should be cleansed forthwith—but the ship's company should be detained in isolation for periods slightly in excess of recognized incubation periods.

A discussion followed the reading of these papers. Dr. Felkin, of Edinburgh, gave an account of the preventive

methods in use among some of the White Nile tribes. Certain African tribes had actually stamped out syphilis by methods of inoculation closely allied to our vaccination. Cholera, to Dr. Felkin's knowledge, had penetrated as far as Uganda and Uynoro, and there the natives recognized the value of preventive methods. On the last occasion they not only evacuated but burned their villages, with the result that the disease was arrested.

Dr. Simpson, of Calcutta, said everything went to prove that there was no danger of cholera being brought to Europe by sea. India had been considered to be the starting-point of cholera, but India had three populations—the Hindoos, the Mohammedans, and the Europeans. The Europeans who travelled were not very subject to cholera; the Hindoos, who were immensely subject to cholera, did not travel at all, because they would lose their caste. Mohammedans were the real danger, and Mecca or Medina might be looked upon as a permanent threat to European security.

Dr. Hewitt, of Minnesota, said quarantine and medical inspection might do much, but not unless they were properly organized.

Le Duc, of Nantes, Professor Brouardel, and several others then spoke of the practical good to be obtained from a system of strict quarantine.

Sir Joseph Fayrer remarked that he was in entire accord with all the ordinary hygienic notions of the French, but he could not think their notions about the efficacy of quarantine were serviceable.

Dr. Stokvis, of Amsterdam, spoke favorably of English sanitary measures in India, and Dr. Robert Pringle brought the discussion to a close by expressing his concurrence with the opinion expressed by Surgeon-General Cunningham, as to the uselessness of quarantine.

SECTION ON BACTERIOLOGY.

ETIOLOGY OF MALARIA.—The first paper was read by Professor Laveran, of Paris, on "The Etiology of Malaria." He said that the hæmatozoon described by him in 1880 had since been recognized by many other observers. He described the chief forms which it assumed—viz., spherical bodies, flagella,

cruciform bodies, and rosette-shaped bodies. There were also deeply pigmented leucocytes to be found in the blood of patients suffering from malaria. The flagella could only be demonstrated in fresh blood; the other forms were well seen in preserved blood. Similar hæmatozoa had been found in different animals—frogs, lizards, marsh tortoises, and birds, yet several points of difference existed.

Professor Crookshank congratulated Professor Laveran on his paper, and said the evidence was in favor of the bodies described by M. Laveran being the cause of malaria; but it must not be forgotten that they were also found in healthy animals.

Mr. W. North said there were, no doubt, peculiar changes to be seen in malarial blood, but he could not believe that malaria was due only to these changes. The plasmodium had never as yet been discovered in air, earth, or water, and no results had ever been obtained by the injection of undoubtedly malarial soil.

ASIATIC CHOLERA AND THE COMMA BACILLUS.—Professor Hueppe, of Prague, then read a paper on the above subject. He described the cultivation of the bacillus in different media and under various conditions. He had been able to produce death in the lower animals, which was an advance on Koch's researches.

Dr. Klein said he did not think comma bacilli always occurred in sufficient numbers to produce cholera, and uniform numbers of bacilli were not always present in cholera.

Dr. Cunningham, of Calcutta, said he had found eight different species of comma bacilli. Comma bacilli were also found in the mucoid tissue of healthy apes and guinea-pigs.

Professor Max Gruber, of Vienna, considered that it was almost proven that the comma bacillus was the cause of cholera, though in some minor points he had not obtained the same results as Professor Hueppe had.

Dr. Bruce, of Netley, said that he had injected a pure culture of cholera bacillus into guinea-pigs, and they died; rats similarly treated did not die. He had found comma bacilli grew well inside eggs, and described some experiments he had performed with egg cultivations.

THE MOUTH AS A FOCUS OF INFECTION was the title of

a paper read by Professor Miller, of Berlin, in which he enumerated the local and general diseases—35 in number—due to the action of bacteria in the mouth, and gave a list of these pathogenic bacteria. In inoculating animals with the saliva of 111 healthy persons, death followed in 101 cases. Two groups of pathogenic bacteria occurred in the mouth, one producing speedy death through septicæmia, the other producing extensive suppuration. The value of antiseptic solutions in prophylaxis was then discussed.

THE BACTERIOLOGY OF DENTAL CARIES.—Mr. Henry Sewill then read a paper on this subject. The active agents in caries, he said, were acids and micro-organisms. As predisposing causes he enumerated, (1) inherent defects in enamel, (2) crowding or irregularity of the teeth, (3) vitiated buccal secretions.

Professor Gruber described a new pyogenic micro-organism—*micromyces Hoffmanni*—and Professor Crookshank gave an account of his observations on *streptococcus pyogenes*, which had led him to conclude that distinct varieties of the organism existed.

CANCER AS AN INFECTIVE DISEASE.—Messrs. Shattock and Ballance contributed the above paper. They maintained that cancer ought to be regarded as a parasitic disease, though it had not yet been found possible to transmit cancer from one species of animal to another, and all attempts at cultivating a microbe had failed as yet. Cancer had, however, been transferred from one rat to another, and from dog to dog.

PSOROSPERMOSIS AS A POSSIBLE CAUSE OF EPITHELIAL TUMORS.—Dr. Sheridan Delépine read a paper on this subject. He concluded that the evidences which he had been able to collect were against the psorospermial nature of the bodies which he had observed in epithelial tumors, and he thought the same conclusions must extend to the bodies observed in Paget's disease of the breast.

SECTION ON THE RELATION OF THE DISEASES OF ANIMALS TO THOSE OF MAN.

Dr. Roux, of Paris, delivered an address on "The Prevention of Hydrophobia," and gave an account of the results obtained in the Pasteur Institute.

THE PREVENTION OF RABIES IN DOGS was the title of a paper read by Dr. George Fleming. He urged that the following measures should be adopted—viz. 1, the destruction of rabid dogs; 2, the control of ownerless dogs; 3, muzzling; 4, dog tax and registration. The value of the muzzle in suppressing rabies had been especially demonstrated in London in 1885. In other countries where rabies prevailed, and dogs were not muzzled, though other measures—as the dog tax, medal on the collar, leading by a leash, etc.—were adopted, the malady continually manifested itself, and numbers of people perished from hydrophobia every year.

M. Nocard, of Alfort, spoke of a prophylactic treatment which he thought applicable to domestic animals, at least to herbivora. M. Galtier announced some time ago that the injection of rabic virus into the veins of the sheep and the goat did not produce hydrophobia, but rather conferred immunity. He had himself made a number of experiments recently, by which he had been able to show, 1, that the intra-venous injection of rabic virus would not produce rabies in horses; 2, that if the quantity injected was sufficient, these horses acquired an immunity against rabies; 3, that it was possible to protect equines inoculated by intro-ocular injection when there were introduced into the veins certain quantities of dilute rabid nervous material. He hoped a prophylactic treatment might arise out of the labors of M. Galtier.

Professor Redfern, of Belfast, thought muzzling in certain areas only was ridiculous.

Dr. Ostertag, of Berlin, said that in Berlin all dogs wore muzzles, and a case of hydrophobia had not been reported for ten years.

SECTION ON INFANCY, CHILDHOOD, AND SCHOOL LIFE.

THE SCIENTIFIC OBSERVATION AND STUDY OF CHILDREN IN SCHOOLS.—Dr. Francis Warner read a paper on the above subject. The paper was based upon observations made on 50,000 children. He had observed that a large percentage of irregular attendance was due to physical weakness. Low nutrition appeared to be largely dependent upon conditions of low development. A class of children presenting certain nerve-signs were ill-balanced and over-mobile, but were

usually mentally bright; certain other mental signs were ordinarily associated with low mental status. Eye affections were very numerous, and ophthalmia in all stages was present in some day schools.

Dr. Jacobi, of New York, suggested that feeble-minded children should be trained apart.

Mr. Noble Smith said he had noted a large amount of physical deformity among the working classes in all parts of London, which he attributed to bad nutrition during childhood.

THE EARLY RECOGNITION AND PROBABLE ARREST OF ST. VITUS'S DANCE IN SCHOOL CHILDREN.—Dr. Sturges read a paper with this title. He said the disease was first detected by observation of the muscles of the face, which twitched; then, if the child became ill-tempered and untidy in his appearance, inquiries should be made of the mother if the child slept well and had sufficient food. The chief causes of chorea arising in the school itself were examinations, unexplained sums, and punishment before other children. If there were any muscular infirmity the hand test was infallible. If the child could hold up both hands straight with the fingers open, and there was no falling back of the hands nor quivering of the muscles, he was free from any danger of chorea.

Dr. Cheadle remarked that there was another cause besides the wear and tear of learning and nervousness, and that was excitement. He did not agree with Dr. Sturges as to chorea not being a grave disorder.

RINGWORM IN ELEMENTARY SCHOOLS.—Mr. Malcolm Morris read a paper with this title. Ringworm, he said, was very common in London, and he lamented that there was no uniform method adopted in board schools in regard to it.

Dr. Colcott Fox said there were three alternatives for the stamping out of ringworm in schools—viz. : 1, to place affected children in isolated schools; 2, to admit them to schools, but place them in a separate room; 3, to isolate them on separate forms, germicides being applied to the scalp, and a cap worn during school hours.

EPIDEMICS IN SCHOOLS.—Dr. Shelly, of Hertford, read the above paper. He pointed out that such epidemics usually originated outside schools and were favored by the aggregation of susceptible material.

SECTION ON CHEMISTRY AND PHYSICS IN RELATION TO
HYGIENE.

Sir Henry Roscoe presided, and gave an address in which he touched on the water supply of cities, the disposal of excreta, air pollution, etc.

TOWN FOGS was the title of a paper read by Dr. W. J. Russell. Fogs acted injuriously mainly in two ways: 1, by the stoppage of light; and 2, by the toxic effect produced by the impurities retained in them—chiefly sulphurous acid and empyreumatic products of carbonism. The author advocated the abolition of fogs by suppressing heating by means of coal.

FOG IN RELATION TO HEALTH.—Dr. Theodore Williams said he believed London fog was not so fatal as many people had supposed, and he had found that some cases of bronchitic asthma were benefited by exposure to it.

Mr. Ernest Hart remarked that the mortality of London during the previous great fogs had been as great as during a cholera season.

A resolution was adopted requesting the proper authorities to consider whether legislative measures could not be introduced to lessen the amount of smoke produced from dwelling-houses in towns, and thus diminish the density of town fogs.

Dr. Sheridan Delépine and Mr. A. B. Gomess exhibited an apparatus designed to show the possibility of removing the smoke of fires from the air of towns, and of using it for disinfecting sewers. By means of a small amount of water falling a few feet, a large amount of air could be displaced, and the smoke of a fire from a chimney diverted into a system of pipes running in any direction, and by a very simple combination of channels and chambers the sewage itself might be used for the purpose of displacing the smoke and causing it to mix with the sewage.

SECTION ON NAVAL AND MILITARY HYGIENE.

The first paper read was on "Modern Quarantine in Canada and the United States," by Dr. Montizambert, Medical Superintendent of the Canadian Quarantine Service.

Dr. Valentin Vignard discussed the relative value and inconveniences of quarantine and medical inspection. In

quarantine the dominant idea was isolation ; in medical inspection it was disinfection. The progress of international sanitary prophylaxis demanded that disinfection should occupy a more prominent place, and he hoped the word quarantine might pass out of use.

Dr. Stopford Taylor pointed out the want of system in the medical supervision of the mercantile marine in Liverpool.

Dr. Béranger-Féraud said that though quarantine was retained, France had not failed to follow the advance of scientific knowledge, and the period of detention of suspected ships or persons was governed accordingly.

Dr. Mason, of Hull, described the precautionary measures adopted with emigrants passing through Hull, to the number of 40,000 or 50,000 annually, *en route* for America.

AMERICAN CLIMATOLOGICAL ASSOCIATION.*

PRESIDENT'S ADDRESS.—The meeting of the Association was called to order at 10 o'clock A.M., September 22d, by the President, Dr. F. S. Knight, whose address inaugurated the proceedings. The deaths during the past year of Drs. H. A. Johnson, of Boston, P. H. Kretzschmar, E. C. Morgan, and Joseph Parrish, members of the Association, were mentioned with expressions of eulogy and regret, and a brief summary of the history and progressive advancement of the Association constituted the introductory portion of the address. The attention of the Association was called to the practical value of a careful study of our therapeutic resources in medical springs and natural waters, illustrated by the statement that one hundred million of dollars are annually spent abroad by Americans at health-resorts possessing no natural advantages over those of the United States. Much of this money could be retained in our own country by a judicious exposition of our resources in this respect. The president reiterated sentiments expressed at a former meeting, to the effect that much good might be accomplished in this direction by holding the annual meetings of the Association at different

* Eighth Annual Meeting, held in the Grand Army Building, Washington, D. C., September 22-25, 1891.

health-resorts. Physicians would thereby gain a personal and practical knowledge, and the proprietors of such resorts be stimulated to improve many faults now in existence. Conspicuous among such faults is the custom of promiscuous occupancy of the same rooms by the sick and the well, alternately. Apartments, in summer or winter resort hotels, occupied by patients afflicted with pulmonary tuberculosis should be disinfected under medical supervision. The cottage system represents the best practical solution of the question.

GENERAL VERSUS LOCAL TREATMENT OF CATARRHAL INFLAMMATIONS OF THE UPPER AIR-TRACT was the subject of a paper by Dr. Beverley Robinson. The author deprecated the tendency toward indiscriminate operative interference in cases of nasal obstruction *per se*. The nasal passages are unequal in so large a majority of individuals as to constitute almost a normal condition. If such obstruction from deviation of septum, etc., can be demonstrated to be a cause of disease, then it should be removed, of course. He did not believe, however, that nasal obstruction was so frequent a cause of disease of the nasal lining membrane or of the ears, eyes, and tonsils, as had been claimed. Warm medicated inhalations are serviceable in catarrhal inflammation of this region, but require added caution, as there is increased susceptibility upon exposure after using them. The nasal douche is often a two-edged sword, with ear trouble as a frequent sequence. A close and clear relation can often be demonstrated clinically between general constitutional state and local disease of the catarrhal type in the upper air-tracts. The author had seen many cases of nasal catarrh remain obstinately unaffected by local treatment, the condition disappearing, however, promptly upon the relief of a coincident and related gastric catarrh or torpid, inactive liver. Hypertrophy of the nasal mucous membrane often coexisted with gastric catarrh of the chronic type, which latter must be relieved before the tonsillar troubles will disappear, in many instances. Treatment by galvano-cautery often relieves, obviating the necessity for surgical removal. Cauterization is innocuous except in certain conditions of catarrhal inflammation of the nasal mucous membrane, characterized by great dryness and irritability, the

formation of scabs and crusts, and a tendency to bleed easily. Carbolized vaseline, or, better, Goulard's cerate freshly prepared, afforded great relief in this class of cases. He did not use as often as formerly the saturated solution of sulphate of copper, once a favorite application in such cases. The association and evident inter-relation of catarrhal affections of the upper air-tracts with the rheumatic and gouty diathesis, had been frequently observed by the writer. Such patients were not benefited by exclusively local treatment. A sojourn at some appropriate resort, with the free exhibition of alkaline and anti-rheumatic mineral spring waters would effect a cure. Enlargement of the lingual tonsil, a frequent cause of a most obstinate cough, which had been variously termed hysterical, anæmic, or nervous, often depended upon a rheumatic or lithæmic diathesis. He had seen it relieved by outbreaks of overt rheumatism. The mechanism of action involved in the production of this cough by enlargement of the lingual tonsil was through an irritation from pressure upon the epiglottis. Caution would, at times, relieve this condition, but not always. Carbolic acid and glycerine applications are also effective in some instances. Globus hystericus is quite often due to the same cause—enlarged lingual tonsil. With regard to chronic laryngitis, he did not believe, with Bosworth, that chronic laryngitis was always a secondary condition, and due to obstruction or other nasal disease. Therefore, treatment should not necessarily be directed to the nasal cavities for the relief of chronic laryngitis.

In hay-fever he considered local applications of rather more value than change of residence. A perverted condition of the peripheral nerves is responsible for many of the symptoms. Cauterization of this hypersensitive surface was often of great service. He was not prepared to express a final opinion as to the value of the ice-bag treatment, but had seen it render excellent service.

Finally, as regards the important question made necessary at times by expediency or financial considerations, "Shall the subject of catarrhal inflammations of the upper air-tracts be treated by the specialists or the family physician?" be assumed the position that the best interests of the patient are subserved by a broad view of the subject, much more likely to

be taken by the general than the special practitioner, a position corollary to the demonstration of an intimate relation between the local symptoms and causative constitutional states of disease.

In the discussion which followed Dr. Bosworth, of New York, said that, while he believed naso-pharyngeal affections to be often clearly related to general disease, he considered nasal disease as a purely local affection. Local treatment for chronic nasal disease, such as hypertrophy, polypi, etc., by sprays or astringent applications, emollients, etc., he thought utterly useless, and that surgical interference offered the only means for a permanent cure.

Dr. Ingals, of Chicago, thought that local treatment for catarrhal inflammations which were acute or subacute would often cure, but that they were useless in chronic affections of this type. He also agreed with the author of the paper, that in many instances there was an intimate causative relation between the local disease and some general morbid state. The phenomena of so-called globus hystericus he had found due to spasmodic conditions of the œsophagus, as well as to enlarged lingual tonsil.

Dr. Shurley, of Detroit, deprecated surgical procedures in cases of nasal disease, unless such a degree of stenosis existed as to make positive its relation as a cause of the catarrhal inflammation. He had examined carefully two hundred cases in which there was either deviation of the septum or some other abnormal state, and yet there had resulted no annoyance to the individual.

GYMNASTIC EXERCISE AS A PROPHYLACTIC AND REMEDY IN CHEST DISEASES was the subject of a paper by Dr. E. O. Otis, of Boston, whose opportunities for observation as medical director of a city gymnasium had convinced him that in scientifically applied gymnastic exercise there was to be found a most valuable prophylactic agent in diseases of the chest, and a means second to no other in certainty of results, for the maintenance of a sound and vigorous condition of the heart and lungs under the trying ordeal of an indoor life. He had repeatedly observed two conditions, especially, which are suggestive of future disease, and which are greatly benefited by appropriate gymnastics. First, a certain lack of vigor and

firmness in the action of the heart—"sedentary heart"—often accompanied with overweight and shortness of breath. Such subjects have probably taken little if any exercise, and have led indoor, sedentary lives for years; second, poor and incomplete expansion of the lungs with diaphragmatic breathing and disuse of the intercostals. These conditions, though not representing actual disease, are a menace to the individual, placing him just within the border-line of absolute morbid states of heart or lungs, as proving inadequate to do their part when unusual demands are made upon them.

For individuals of the sedentary heart class the gymnastic exercise appropriate (based upon data afforded by careful examination) is first, light, slow work, rapid walking or slow running, chest weights, gentle rowing, and free-hand exercise. If the case is one of poor lung expansion, he is put upon lung-expanding apparatus of various kinds, rowing, free-hand work, or class work with wooden dumb-bells. Swimming is one of the best forms of exercise for expanding the lungs. The spirometer, except for testing purposes, is of little value. Frequent physical examinations should be made and the exercise adjusted to varying conditions. Over-development of the chest muscles is often detrimental to good lung expansion. For the two classes described above appropriate gymnastic exercise, as indicated, will result in marked and rapid improvement, and the means here outlined may be utilized in actual disease of the lungs and heart under careful medical supervision. It is in line with the high altitude climatic method, and accomplishes much in teaching patients how to breathe properly, and in giving to the muscles of respiration the strength necessary to fulfil their function. This is especially of value in its effect upon the large class of diaphragmatic breathers, either with or without actual lung disease. The intercostals must be trained to do their share in the mechanism of respiration. The writer considers an eclectic the best system of gymnastic exercise.

Dr. Williams, of Brooklyn, in opening the discussion, expressed the opinion that proper breathing was the most important of all means of prophylaxis in phthisis. He thought it just as necessary to cultivate and exercise the diaphragmatic muscles as the intercostals in respiration. The speaker

referred to some interesting observations made by him in a recent examination of Professor Checkly, the gymnast.

Dr. Gihon, of the U. S. Navy, desired to emphasize the radical importance of intelligent medical direction. He had noticed that the naval cadets who had, by reason of enthusiastic devotion to gymnastics and a high degree of training, become famous during their sojourn at the Naval Academy, had since died, many of them, of phthisis. They had either discontinued it abruptly upon leaving the academy, or had been subsequently unrestrained by intelligent supervision. He had also observed at the Marine Barracks of the Brooklyn Navy Yard, that since the establishment there recently of a gymnasium for the men, over which there was no medical director, cases of hernia had greatly increased in number among the men.

Dr. Ingals, of Chicago, asked the writer of the paper the value of cycling as a means of exercise, especially in strengthening the muscular action of the heart. Dr. Otis considered cycling very valuable as an exercise for the heart. Riders, however, always sat with their shoulders thrown forward, and some corrective exercise should be carried out to correct a resulting defect in this respect.

THE CLIMATE OF THE GREATER PIEDMONT AND THE MOUNTAINOUS REGIONS OF THE SOUTH was the title of a paper by Dr. W. C. Van Bibber, of Baltimore, in which the writer advocated the climatic and other natural advantages of the mountainous regions of West Virginia, North and South Carolina, Eastern Tennessee, Kentucky, and Northern Georgia, as affording places of residence giving not only immunity from many diseases, but by reason of the influence upon race of physical environment, promoting the development of a high type of manhood, physically and intellectually. The races of this section, embracing about 75,000 square miles, had reflected with high honor the effect of environment in forming certain mental and physical characteristics among the people, as witness the records of our nation's history. Originally the home of the Cherokee and Choctaw Indians, grain-feeders, and acknowledged superior in intelligence to other tribes living in the basins and toward the coast on either side, this was subsequently the section which gave to our country such men

as Thomas Jefferson, Abraham Lincoln, Jefferson Davis, Andrew Johnson, and others of like stamp. This Piedmont region furnished more men to the Union army during the late war (140,000) than did many of the Northern States. It is accessible, attractive in its resources both mineral and agricultural, picturesque in its beauty, and has an advantage over other sections of the South in the fact that the race question can never be an issue, since the climate and air are inimical to the development of the negro. As to its healthfulness, the bacillus of Koch is unknown in a certain region of Western North Carolina and Eastern Tennessee, nor have any of the bacilli of malaria been found in the same section. He did not think the Piedmont climate of so much value in curing established disease of the lungs, but as a means of prophylaxis it had no rival.

Dr. Carl Von Ruck, of Asheville, N. C., could confirm the statement that consumption and malaria did not exist in the section of country referred to, among the natives. As to the effect of the climate, altitude, and air of this region upon established disease of the lungs, he believed positively in its curative value, having witnessed such results in patients under treatment.

THE SPUTUM IN PULMONARY PHTHISIS, a paper by Dr. E. L. Shurley, of Detroit, Mich., gave the results of a series of studies and scientific experiments embodied in the paper, admittedly throwing no new light upon the first step in the pathogenesis of tuberculosis, but as demonstrating the varying degrees of strength and viability, with resulting intensity of infection from different cultures of bacilli, they afford a basis for the explanation of varying degrees of susceptibility in individuals to the development of tuberculous disease. The method of experimentation observed, elaborately outlined in detail, were : 1. Cultivation under different conditions and in different media ; 2. Inoculation with control experiments.

Drs. Tyndall, Gihon, and Williams participated in the discussion which followed, the latter confirming from personal experience the statements as to the varying degrees of viability of different chemical extractions of tuberculous tissue. He believed that the only explanation of variations in the action of different cultures of bacilli was to be found in the viability and violence of action of the bacillus itself.

SURGICAL TREATMENT OF ACUTE AND CHRONIC EMPYEMA.—Dr. Maurice Richardson, of Boston, Mass., read a paper upon this subject. Drainage, he considered of equal importance with asepsis or antiseptis. The most desirable object in such cases was to obtain lung expansion, and this can be best accomplished by drainage. Empyema is essentially a surgical affection, though aspiration had occasionally proven efficacious. It was often, however, dangerous, in that it led to delay in adopting surgical measures which should be resorted to early, in order to prevent adhesions and interference in consequence with expansion. The author's method of preparation for operation to secure drainage involved the most thorough aseptic and antiseptic precautions. The field selected should be scrubbed twenty-four hours previously with soap and water and a hot-water poultice of aseptic cotton batting should be applied for twelve hours, followed by a similar poultice rendered aseptic with corrosive sublimate, which should remain *in situ* until immediately preceding the operation. He did not think general anæsthesia advisable, as it interfered with the voluntary coughing of the patient during evacuation, which was important in assisting in the expulsion of pus and in expanding the lung. The point of incision was a matter of election. He usually selected the fifth or sixth interspace in the axillary line. In cases which were chronic, the cavity being closed by collapsing walls, drainage could be best accomplished by inserting the tube high up. It is good policy to consider all cases as chronic. No advantage resulted from cutting through the latissimus dorsi, and several objections could be urged. Toward the front of the axillary line the proximity of the heart was objectionable. He preferred to all methods that of a free incision two or three inches in length. Drainage-tubes should be at least three eighths of an inch in diameter, two or more in number, fastened with a shield and supplied or not with a rubber-tissue valve according to the condition present. Valves were of advantage to create vacuum pressure where ordinary respiration fails to produce proper lung expansion. Rubber is the best material for drainage-tubes. The tube should remain in position until forced out by the filling out of the thoracic cavity, rendering it impossible to replace them. To remove clots, etc., at time

of operation pure boiled water is best. Irrigation he considered unnecessary unless there was an offensive odor to the discharge. If odor existed, he had found a solution of strychnine 1 to 200 beneficial. The ordinary antiseptics were dangerous, as the pleural membrane absorbed readily. He had seen systemic carbolic acid poisoning, not only from the use of irrigation with carbolic solution, but from the application of carbolyzed gauze over the incision wound.

Hemorrhage could be often arrested by the pressure of the drainage-tube upon the margin of incision. The sound of ingress and egress of air immediately after operation afforded an indication of a probable favorable result. Cases of long standing and tuberculosis cases were unfavorable in prognosis. In chronic empyema resection of the ribs which was indicated was of value not in proportion to the extent of rib removed, but to the number resected. Six or eight ribs could be resected in certain cases with proportionate advantage. The contraction of the chest-wall thereby accomplished was more satisfactory than when a smaller number were resected. The length of rib removed should be equal to the depth of the cavity. He had not tried the suggestion emanating from the Harvard school of anatomy, to force together the ends of the resected ribs and wire them. The immediate results of the operation of incision and drainage, if properly done, were always gratifying if not curative. He had lost two cases in fifteen operations, death occurring from recurrence and tuberculosis.

Dr. Loomis endorsed the view that surgical incision was *the* rational and only satisfactory treatment in empyema. In acute empyema a cure was not difficult, provided the opening was sufficient. If the case was chronic he considered the prognosis as varying according to the amount of plastic or fibrous matter found in the cavity as a result of the pus-forming process.

LYMPHOTISM.—Dr. F. H. Bosworth, of New York, in a paper with this title, described lymphotism as a condition of disease occurring in early life characterized by a glandular involvement which might exist widely, but which usually manifested itself in the cervical region, the upper air-tract, and the fauces in adenoid enlargements, tonsillar hypertrophies, etc.

There was, as a rule, an associated anæmia, more or less profound headaches, interference with normal respiration, and consequent imperfect assimilation from defective oxidation. The prognosis he considered favorable provided the condition is recognized as one requiring attention and proper treatment inaugurated. Constitutional treatment is most effective, and the iodide of iron, in the form of a syrup or in Blancard's pills, the remedy par excellence. The dose should be at least two grains of the iodide of iron thrice daily.

Dr. Jacobi, of New York, did not think lymphotism existed as an entity in disease, but that it was a secondary process originating in a local irritation. Cervical adenitis, from stomatitis, eczema, scrofulous glands, so called, of the omentum from hyperæmia due to diarrhœa, and other similar conditions, were cited as examples of local irritation acting as a cause of the secondary condition. The primary irritation should be relieved and the lymphotism prevented.

Dr. Darlington, of Arizona, related an experience with fifty cases of apparent epidemic adenitis of the cervical glands of undetermined etiology.

HISTOLOGICAL CHANGES WHICH TAKE PLACE IN THE LUNGS IN CURED PHTHISIS PULMONALIS AND THE INFLUENCE OF DIATHESIS IN THE DEVELOPMENT OF SUCH CHANGES was the subject of a paper entitled as above, by Dr. A. L. Loomis, of New York. He described a series of pathological observations made upon the records of 524 autopsies done at Bellevue Hospital, eight per cent of which were found to represent instances cured of tuberculous disease though the patients died of non-tuberculous affections. The records of this table of cases were prepared by Dr. Henry P. Loomis. As regards the lesions which may be regarded as evidence of cured phthisis, patches of induration at the apex of the lungs, for a long time considered characteristic, have been demonstrated as a result, at times, of other causes of irritation than tubercle. Masses of fibrous tissue in the lungs, until after the discovery of the tubercle bacillus, were not positively demonstrable as of tubercular origin. Of the 44 cases observed, forming the basis of his paper, in 38 the gross appearance of the affected lung showed firm adhesion to the costal pleura with puckering and depression of the adherent surface ;

sections showed varying numbers of fibrous nodules scattered through the lung apex, situated in most instances just beneath the adherent surface, and continuous with the thickened pleura. A few were in the central portion of the upper lobe, connected with the pleural surface by dense bands of fibrous tissue. Soft cheesy or calcareous masses were usually found in the central portions of these nodules, and in six small closed cavities occupied the centre of the larger nodules. A linear cicatrix was found in a few nodules, marking the site of a healed cavity. Lamellæ of less dense fibrous tissue, often traversed by contracted, obliterated, and dilated bronchi and impervious blood vessels, were found immediately around many of these nodules. An emphysematous condition was observed in the surrounding lung-tissue, which appeared normal. Two instances showed the entire upper lobe of the lung transformed into a homogeneous fibrous mass. More or less deep pigmentation was noted in the fibrous tissue of the nodules. On microscopical examination of these nodules, more or less completely organized fibrous tissue was observed as the prominent histological change.

In many, at the edge of the tissues destroyed by the tubercular process, new connective tissue could be seen just developing, and the fibroid process evidently originated in one of these ways: 1, By round-cell infiltration of the interlobular connective tissue; 2, by round-cell infiltrations of the alveolar walls; 3, by round-cell infiltrations around the vessels and bronchi which became contracted and obliterated by the fully developed fibroid growth. In some sections pleuritic fibrosis seemed to be the first change, and in all lines of fibroid tissue could be traced from the nodules to the pleura. One condition was so constantly present as to lead to the conclusion that it was essential, a condition of intense hyperæmia always surrounding the tubercular areas where recent fibroid processes were active. The developed fibroid masses were also found studded with new capillary vessels. The different elements composing tubercle could not be determined. Tubercle bacilli could only be found in one or two specimens. Inoculation experiments with the contents of the nodules upon rabbits gave uncertain results, producing tuberculosis in certain cases and no reaction in others. General tuberculosis followed

in no case. The conclusion from observations made was that the only method of arresting tubercular processes in the lungs was by the development of fibroid processes in and around the tubercular areas. The occurrence of this reparative process in an individual he believed to be dependent upon diathetic tendencies. The two diathetic conditions involved affecting tubercular process favorably or adversely were the fibroid and the strumous. Necrotic changes occurring in parenchymatous tissue can only be repaired by fibroid development, which must be pathological in intensity in order to be effective if the cause of the necrosis be especially powerful. Several clinical cases were cited illustrative of the antagonistic action of diathesis, especially marked in arthritic individuals who possessed a relative immunity from all forms of tuberculosis. Tuberculosis of the pulmonary type occurring in patients with a parental history of general fibrosis had a tendency to a chronic course and spontaneous cure. Of 70 cases of cured cases of pulmonary phthisis personally observed by the writer, 52 presented marked evidences of general fibrosis. The prognosis in tuberculosis is largely dependent upon the diathesis and family history of the patient, a factor in prognosis which has been unwisely ignored since the discovery of the tubercle bacillus. A better explanation of the varying results of tubercular disease in different individuals than that of intensity of bacilli infection is to be found in the presence or absence of diathetic antagonism. Koch's tuberculin, if it has any power in arresting tubercular processes, does so by exciting around the diseased areas inflammatory processes which favor fibroid development.

In the discussion following, Dr. Jacobi said that he believed the cure of local tubercular disease to be dependent upon the development of surrounding fibroid tissue, and that this development could be assisted, he thought, by the use of certain agents having the property of setting up local irritation, if given in small doses. He had used for twenty years, as a matter of routine, in conjunction with other measures, arsenic, in the treatment of pulmonary tuberculosis, in small doses. He did not consider it a specific, but believed it of decided value. Phosphorus, given by Wagner experimentally to hasten the cure of fractured limbs in rabbits, he believed to

be rather unsafe in phthisis, in that the resulting irritation was excessive.

Dr. Curtin thought that the results claimed for the treatment of pulmonary tuberculosis by injections of iodine into the pulmonary cavity, suggested some years ago by Dr. Pepper, could be explained by the development of fibroid tissue resulting from the injections. He had recently noticed, in an autopsy upon one of Dr. Pepper's patients, so treated some years ago, the same pathological conditions mentioned by Dr. Loomis.

Dr. Beverley Robinson had followed Dr. Pepper's suggestion, and had used iodine by injection into the pulmonary cavity, with modification and amelioration of symptoms as a result. He believed creosote, used as he had recommended it some years ago, to be of more benefit than any other single agent mentioned in the discussion.

Dr. Tyndall suggested that the terms destructive and constructive metabolism be used for scrofula and fibrosis.

Dr. Fremont-Smith mentioned the fact that Lannelongue explains the *rationale* of cures resulting from his method of injecting a solution of chloride of zinc in tubercular disease of joints as being the result of the développement of fibroid tissue.

Dr. Jacobi saw some of Lannelongue's patients treated, and others shown as examples of curative results obtained. The strength of the zinc solution used was fifteen per cent. Proof of cure, in an absence of pain and swelling, existed in some of the cases shown as cured, but in several swelling was still present, and the patients—children from three to eight years of age—cried out with the pain when touched. These cases had been under treatment from two to six weeks.

Dr. Williams considered the teachings of Dr. Churchill in line with the facts as elaborated in the paper read. Calcification, while not identical with fibrosis, is related to the arthritic and gouty diatheses. Hypophosphites were promotive, he believed, of irritative processes resulting in fibroid-tissue development.

Dr. Loomis, in closing the discussion, expressed the opinion that the sole benefit derived by tuberculous patients from creosote was through its action in promoting assimilation by assisting digestion.

ANALYSIS OF RECORDED CASES OF PHTHISIS PULMONALIS, on which Dr. S. A. Fiske, of Denver, Col., gave the tabulated results in a large number of cases, illustrative of the modifying effects of suppurative and symptomatic treatment, assisted by the climatic effects of a residence in Colorado.

Dr. Ingals asked for an explanation of the remarkable frequency of hemorrhage as a cause of death in the cases mentioned.

Dr. Fiske stated in explanation that hemorrhage was cited as a cause of death in some cases in which it was only indirectly responsible ; after a hemorrhage, the patient, who had previously improved, never rallying and becoming progressively worse. In only one case was death due directly to absolute loss of blood.

ATTEMPTS TO DISCOVER SPECIFICS FOR PHTHISIS was the subject of a paper by Dr. H. F. Williams, of Brooklyn. The present status of intelligent medical investigation in the field of tuberculosis, he said, is distinctly not in the line of attempts to discover a specific for phthisis or other tubercular disease, but toward the accumulation of agents and measures by which the disease processes may be modified, and relief obtained through the upbuilding of nutrition and constructive metamorphosis generally. His observations had led him to believe that the activity of bacilli varied within wide limits, depending upon the removal of the bacilli in any given case from the original source of development. Bacilli diminished in the intensity and violence of their action by a process of self-attenuation. As to the various methods of antagonizing tuberculosis, vaunted at different epochs as having specific value, his experience led him to place great confidence in the modifying influence for good from the use of the pneumatic cabinet. By its use the lungs could be filled with aseptic air, and thus the fermentative decomposition and activity of lower types of micro-organisms could be controlled, and the activity of the tubercle bacilli in that way lessened.

Dr. Carl von Ruck, of Asheville, N. C., in the discussion which followed, stated that he had used, with much benefit in some cases, the pneumatic cabinet. It was not appropriate to all cases, and in some there were decided contra-indications to its use. Every case of phthisis required discrimination in

the agent used as a remedy. The effect of the pneumatic tube was largely upon the heart and circulation, promoting a general improvement, giving better aeration to the lungs, and making more blood. It should only be used as an adjunct to other methods.

THE VALUE OF KOCH'S REMEDY EMPLOYED AS AN ALTERATIVE; REACTIVE FEVER PREVENTED was the title of a paper by Dr. Frank Fremont Smith, of St. Augustine. Personal observation in Berlin and experience with his own cases in Alicia Hospital, St. Augustine, lead to the following conclusions :

1. The dose of tuberculin is a widely varying quantity, to be determined, with its rate of increase for each case, only by direct experiment.

2. The only therapeutic dose is such a quantity as arouses no reactive temperature, every reactive fever being the expression of an overdose—*i.e.*, a poisonous dose.

3. Tuberculin, when successful by fever reactive method, is so despite, not by virtue of, reactions.

4. Tuberculin by non-reactive method acts as a powerful upbuilding alterative to the tuberculous subject.

5. Cases in all stages of tuberculosis may be treated by non-reactive method without danger. To produce every second day the ultra-physiological action of tuberculin, as exhibited in fever reactions, disturbs the general equilibrium and disarranges nervous, digestive, and secretory functions, upon whose very quietude and uninterrupted activity substantial improvement is of necessity based. Experiments begun January 27th, 1891, with non-reactive method, give in twelve cases uniform gains in the six incipient cases: 1st case, gain in thirteen weeks, 17 pounds; 2d case, gain in ten weeks, 20 pounds; 3d case, gain in eighteen weeks, 12 pounds; 4th case, gain in five weeks, 10½ pounds; 5th case, gain in twelve weeks, 3½ pounds; 6th case, gain in five weeks, 3 pounds.

(To be continued.)

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

SCIENCE IN BREAD MAKING.—At the recent annual meeting of the American Chemical Society, the question of the value of carbonate of ammonia as a leavening agent in bread, or as used in baking powders, came up for discussion. The consensus of opinion was in favor of the employment of ammonia. It was stated as a fact that ammonia rendered the gluten of the flour more soluble, and that the bread in which this action was produced by carbonate of ammonia must be more digestible, and hence more healthful, and because of the extreme volatility of carbonate of ammonia and its complete expulsion from the bread in the process of baking, it is one of the most useful, most healthful and most valuable leavening agents known. These conclusions are borne out by the elaborate experiments made by Professor J. W. Mallet, of the University of Virginia, which show that bread made with a baking powder in which one per cent of carbonate of ammonia is used, is more wholesome, because the ammonia serves to neutralize any organic or lactic acid present in the flour.

THE RADICAL CURE OF NON-STRANGULATED HERNIA has gained much by the improvements in modern surgery. The aseptic and antiseptic methods have rendered the subsequent treatment in this operation almost entirely free from danger.

M. Lucas-Championnière has performed two hundred and fifty-four operations for this purpose under the most diverse conditions.

The *Semaine Medicale* reports that at the meeting of the Academy of Medicine, August 25th, M. Lucas-Championnière described, in a clear and concise manner, his method of performing the operation as follows :

“ Since 1881, when I performed my first operation for the radical cure of non-strangulated hernia, I have operated two hundred and fifty-four times. Of these cases, I have lost only two : one in which the operation was performed under the most unfavorable conditions, and another in which the patient

was seized with internal strangulation, and died before I was notified.

“ But the danger of death, even in cases usually considered very unfavorable, are small, for I have operated successfully in many which are usually considered very unpromising. I may mention the following : First, a woman, fifty-one years of age, who weighed two hundred pounds, operated on for umbilical hernia measuring seventy-eight centimeters around the base. Second, a woman with inguinal hernia descending to the knee. Third, a man in whose case I was obliged to divide the abdominal walls to the extent of ten centimeters. Fourth, a woman having an intra-abdominal sac.

“ Notwithstanding the favorable statistics here given, I consider the radical cure of hernia very difficult, and necessarily very fatal, and even useless unless performed under definite conditions and according to a method which is quite complicated.

“ If the method employed is good the results are good. The greater number of my patients were not obliged to wear a truss, and they very soon omitted to wear the protecting belt which I advise during some months after the operation. In some bad cases, however, it is necessary to wear a bandage as a protection when the cicatrix is not strong or is insufficient.

“ The indispensable conditions for the success of my operation are as follows : First, destruction of the serous membrane as far as possible, even into the abdomen ; second, destruction of all the epiploon accessible and all that can be drawn into the sac ; third, in the region of the hernia, to give increased protection by forming a strong and extensive cicatrix.

“ My two hundred and fifty-four cases may be classified as follows :

“ Inguinal hernias, two hundred and twenty-two ; in males, two hundred and five, of which number fifty-nine were congenital ; and seventeen in females.

“ Crural hernias, fourteen ; in females, eleven, and three in males.

“ Umbilical hernias, seventeen ; in the female, eleven large umbilical hernias ; six epigastric hernias, five in the male and one in the female.

“ One case of traumatic hernia.

“ Of the inguinal hernias in the male, the most satisfactory results are obtained in congenital cases, for they are met with in patients in whom the abdominal walls are, generally, in pretty good condition. There are many cases of hernia that are not considered congenital which are really such, and therefore offer all the favorable conditions of the congenital.

“ The seventeen cases of inguinal hernia in the female, together with the other cases operated on by me in the female, allow the assertion that, in every case of hernia in young women, a cure is absolutely certain, and the results are always good. The relations of this form with the genital organs in the female make it a very painful one, and the cure brings complete relief.

“ In the fourteen cases of crural hernia the operation gave excellent results ; but they show how easy it is to make it unsatisfactory.

“ Umbilical hernia is the form which, perhaps, gives the most striking results ; and in the eleven cases of large umbilical form the operations may be considered as most successful cases of laparotomy ; the lesion gave the certainty of complete impotence for the patient in a short time if not relieved.

“ The slight epigastric hernias, which are, however, very painful, give most satisfactory results. I was twice obliged to resect the suspensory ligament of the liver in very painful hernias, its anterior extremity being involved with the hernial sac.

“ The cases of traumatic hernia on which I operated resulted very satisfactorily, although the operation necessarily extended over a surface enormously large.

“ In presenting so large a number of operations, it is possible to show more definitely than has been done heretofore the indications necessary for the radical cure of non-congenital hernia.

“ The danger incurred by patients operated on under such conditions being extremely slight, it may be asserted that the radical cure should be the rule and not the exception, but subject to the following reservations, which, to a certain extent, bring the field for operation within very definite limits :

“ In very young children I would not advise an operation

unless in very exceptional cases, for there is not sufficient tissue to warrant an extensive operation, and the case is not without danger. After the age of six or seven years the conditions are very different. Such children bear the operation well, and the subsequent development of the child must be benefited by it.

“ In the old the operation is dangerous, and should not be performed unless the circumstances are urgent, or in case of accidents which gravely threaten the general health of the sufferer.

“ Even in cases over forty years, it is necessary to be prudent. I have operated on such a great many times, but I think the operation should not be performed except in urgent cases, as those in which great pain exists ; when it is irreducible or otherwise unmanageable ; in digestive troubles ; inability to work, etc.

“ An enormous volume of the hernia is not a favorable indication under any circumstances. The surgeon should rather try to prevent the hernia from acquiring such an enormous size than to wait for such a result before operating.

“ In patients from seven to forty years of age he should always be willing to operate. Indeed, all hernias in any way complicated should be operated on ; or when painful, irreducible, or otherwise unmanageable or increasing in size, etc.

“ He may operate on all who wish to leave off the use of the truss ; on all who wish to remove the deformity of the hernia ; on all in whom it causes great inconvenience in their occupations ; in cases in which the social relations will be benefited by its removal ; in those in military service ; in professional travellers ; in those wishing to marry, etc.

“ I except only those who are sick ; the cachectic and those whose abdominal walls are in such bad condition that hernias are likely to multiply and those in which the walls give way or stretch in many places.

“ Congenital inguinal hernia should be operated on in all cases without exception, especially those which are accompanied with some ectasis of the testicles.

“ Finally, in females, when sufficiently young, as I have insisted on, the operation should always be performed, for it has for them peculiar advantages, and removes the danger of accidents that might prove specially distressing.”

IN FRACTURES OF THE CLAVICLE, M. Poirier has employed the suture in a great many cases with remarkable success. In a report of a lecture of this able surgeon, the *Gazette Hebdomadaire* states that he employs it even when the integument remains intact ; when the bone has been splintered, and even when it is comminuted ; whenever there is reason to fear a lesion of the blood vessels or of the nerves in consequence of a large callous. He uses in his operations only silver wire. A very difficult case in which he performed the operation has been entirely successful.

The surgeon thinks that fractures of the clavicle are as amenable to this treatment as fractures of the patella.

EUROPHEN is a new antiseptic medicament designed to replace iodoform. It is obtained by the action of iodine upon isobutylorthocresol. Its pharmacology and bacteriology have been studied by Siebel, and its therapeutic action by Eichhoff. It appears in the form of an amorphous yellow powder, exhaling a slight odor resembling that of saffron. It is insoluble in water and in glycerine, and more soluble than iodoform in alcohol, ether, chloroform, and the oils. Europhen adheres better than iodoform to the skin and to open wounds, and an equal quantity of it, by weight, will cover a surface five times greater.

This iodide of isobutylorthocresol is not toxic. Dogs were found to take two to three grammes of it with impunity ; and the human organism will bear one gramme of it without unpleasant phenomena save a slight feeling of weight in the stomach. The urine of patients who had absorbed Europhen did not contain iodine.

Eichhoff employed it successfully in dressing both hard and soft chancres. He used it as a powder and also in the form of a one per cent or two per cent ointment. He furthermore employed it successfully in hypodermic injections for syphilitic patients suffering from the secondary and tertiary symptoms of syphilis. These injections consisted of one gramme of Europhen to one hundred grammes of olive oil, and of this one half to one cubic centimetre was injected daily in one dose. Eichhoff also employed Europhen in varicose ulcer and ulcerative lupus, as well as in eczema, psoriasis, and favus, in all of which it proved to be efficacious.

Ointments containing one per cent to two per cent of Euphen are as strong as need be used. Five per cent ointments caused a certain amount of irritation.—*La Semaine Medicale*, July 29th, 1891—*Repertoire de Pharmacie*, August 10th, 1891.

ANTI-KAMNIA comes in the form of a snow-white powder showing particles of broken crystals, put up in one ounce, metal, screw-capped boxes. According to an analysis by William A. Hall, Ph.B., which appeared in the *Druggist's Circular and Chemical Gazette* for May, 1891, it is composed of: Acetanilid, 77.55 per cent; NaHCO_3 , 19.32 per cent; NaCl , 1.30 per cent; $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$, 0.83 per cent; moisture, 0.80 per cent; loss, 0.20 per cent. Total, 100.00 per cent.

It is said to be "analgesic, antipyretic, and anodyne; valuable in neuralgia, myalgia, sciatica, acute rheumatism, hemi-crania, also headache and other neuroses due to irregularities of menstruation. It will reduce temperature and relieve pain with the greatest certainty and celerity, and has no evil after-effects."

But Dr. E. P. Easley, of New Albany, Ind., reports (in the *American Practitioner and News*, September 12th, 1891) a case of fatal poisoning by it.

"A stout, robust woman, weighing one hundred and sixty-five pounds, twenty-two years old, took, by mistake, for a slight headache, twenty-four grains of antikamnia. In a few minutes she became wildly delirious, then unconscious, and died in ten hours after swallowing the medicine. A careful, methodical *post-mortem* examination failed to discover any lesion, death being the result of the action of the drug alone. The greater portion of her body was cyanosed. The membranes of the brain were of a sky-blue color, as were all the fibrous structures wherever found. The right ventricle was filled with clotted blood very much bleached."

Such evidence of the potency of this new remedy shows the importance of its use being limited to prescriptions by physicians only; and, moreover, that "has no evil after-effects" should be eliminated from its alleged properties, because, evidently, though preferred to other antipyretics and anodynes by many physicians who have used it, it is like all other medicines of its class, sufficiently potent to be followed by very bad after-effects if taken in excess.

THE PROGRESS OF INFECTIOUS DISEASES AND DEATH RATES AT THE MOST RECENT DATES.

COMPILED BY HARRY KENT BELL, M.D.

ALABAMA.—*Mobile*, 31,076: Reports 48 deaths during August, of which 18 were under five years of age. Annual death-rate, 18.4 per 1000. From zymotic diseases, 9, and from consumption, 11.

CALIFORNIA.—Reports from sixty-six cities, towns, and localities, having a population of 706,054, during August, show 975 deaths to have occurred from all causes. Annual death-rate, 16.56. Deaths from consumption, 122; pneumonia, 52; bronchitis, 19; and congestion of the lungs, 15. Croup and diphtheria caused 31 deaths; typhoid-fever, 37.

San Francisco, 330,000: Deaths during the month of August, 550. From consumption, 66; acute lung diseases, 66; croup and diphtheria, 19; typhoid-fever, 17. Death-rate, 16.66.

Los Angeles, 53,394: Deaths, 52. From consumption, 11; acute lung diseases, 3. Death-rate, 11.75.

Oakland, 50,000: Deaths, 67. From consumption, 7; acute lung diseases, 6. Death-rate, 15.96.

CONNECTICUT.—The mortality report for August comprises 167 towns. There were 1248 deaths reported in the State during the month. This was 51 less than in July; it was 32 less than in August, 1890, and 30 less than the average number of deaths in August for the five years preceding the present.

The annual death-rate of the large towns was 21.4 for August as against 25.9 for July.

The two cities having the highest death-rate were Wallingford, 32.8, and Torrington, 31.7. There were 22 towns reporting no deaths. The average annual death-rate for the large towns was 21.4, while that of the small towns was only 17.9.

The deaths from zymotic diseases were 456, being 36.5 per cent of the total mortality against 36.2 per cent in July.

New Haven, 86,045 : Deaths, 140—under five, 55 ; from zymotic diseases, 45. Death-rate, 17.5.

Hartford, 53,230 : Deaths, 95—under five, 35 ; from zymotic diseases, 34. Death rate, 19.1.

Bridgeport, 48,866 : Deaths, 75—under five, 33 ; from zymotic diseases, 26. Death-rate, 17.4.

DISTRICT OF COLUMBIA, 250,000 : Reports for five weeks ending August 29th, 571 deaths, of which number 256 were colored. Annual death-rate per 1000, 23.7.

From zymotic diseases there were 191 deaths, and from consumption, 45.

ILLINOIS.—*Chicago*, 1,200,000 : Deaths during the month of August, 2270—1205 under five years of age. Death-rate, 22.70. From zymotic diseases, 849 ; consumption, 171.

IOWA.—*Davenport*, 28,500 : Reports for August, 38 deaths—21 under five years of age. Annual death-rate per 1000, 15.9.

LOUISIANA.—*New Orleans*, 254,000 : Reports for three weeks ending August 29th, 372 deaths, of which 108 were colored, and 92 were under five years of age. Annual death-rate, 25.47 per 1000.

There were 68 deaths from zymotic diseases and 45 from consumption.

MAINE.—Sixth Annual Report of the State Board of Health for the year 1890, pp. 306. Of 400 local boards of health, 120 expressly report no cases of diphtheria, scarlet-fever, or typhoid-fever during the year ; and none are reported by 40 other boards, or a total of 160 towns from which no reports of these diseases have been made. The reports show that during the year diphtheria occurred in only 96 towns as against 138 in the previous year. The most serious and prolonged outbreak occurred in Eastport, due to the surprising ignorance or criminal negligence of a mere nominal board of health ; and a " doctor " who was attending a child with the disease, when being inquired of by the father of the child if it could go out the same as usual, answered, " Yes ; they were all going

out, and he might as well as the rest ;" and other physicians of the town did not feel called upon to report cases because they had not been " asked " to do so by the selectmen, who had appointed an ex-deputy sheriff health officer, at two dollars a day, to display his ignorance in conformity with the wisdom of his selection. Finally the people rebelled against such a " health officer," and he was dismissed, but not until there had been many cases of diphtheria before there were any measures undertaken to restrict it.

That it should be no easy matter to propagate preventive measures among communities such as Eastport, as the State Board of Health has found out, is not surprising. The Board has made considerable progress, notwithstanding, in organizing local boards of health throughout the State ; but with mere perfunctory boards, incapable, as many of them are, of appreciating the difference of qualification between an ex-sheriff or other local politician and a competent physician to exercise the functions of health officer, and in default of an effective registration law, it is difficult to mark the progress of the Board in reducing the death-rate.

The Board is diligently exerting itself to educate the people by the publication and dissemination of circulars and other documents on preventive medicine ; but it will be a long time before such means will avail much without a corps of local health officers of better quality than can be obtained by temporary employment at two dollars a day.

MARYLAND.—*Baltimore*, 455,427 : In August the total deaths were 857, a decrease of 32, compared with the corresponding month of August, 1890. Of these, 650 were white and 207 colored ; a death-rate of 20.31 per 1000 for the former, and 35.00 per 1000 for the latter. The death-rate for the whole population was 22.60 per 1000. 35 persons died from infectious diseases, 79 from consumption, and 112 from cholera infantum. 403, or 44.00 per cent of the total deaths, were in children under five years of age.

During the month 140 cases of infectious diseases were reported, an increase of 3 over the preceding month.

MASSACHUSETTS.—*Boston*, 459,062 : During August, 1891,

deaths reported, 977, of which number 453 were under five years of age. Annual death-rate per 1000, 25.53. From zymotic diseases, 299, and from consumption, 105. Cases of contagious diseases reported, 207.

MICHIGAN.—For the month of August, 1891, compared with the preceding month, the reports indicate that typho-malarial-fever, typhoid-fever, dysentery, and cholera infantum increased, and that puerperal-fever, membranous croup, pleuritis, measles, influenza, inflammation of brain, diphtheria, erysipelas, and cerebro-spinal meningitis decreased in prevalence.

Compared with the preceding month, the velocity of the wind was less, the prevailing direction was the same (west), the rainfall was considerably more; the temperature was higher, the absolute and relative humidity were more, the day ozone and the night ozone were less.

Compared with the average for the month of August in the five years 1886-90, scarlet-fever was more prevalent, and small-pox, membranous croup, puerperal-fever, erysipelas, typho-malarial-fever, inflammation of brain, pneumonia, and cerebro-spinal meningitis were less prevalent in August, 1891.

For the month of August, 1891, compared with the average of corresponding months in the five years 1886-90, the velocity of the wind was greater, the prevailing direction was west (instead of southwest), the temperature was higher, the rainfall was much greater, the absolute humidity and the relative humidity were slightly less, the day ozone was less and the night ozone was slightly more.

Including reports by regular observers and others, diphtheria was reported present in the month of August, 1891, at sixty-two places, scarlet-fever at seventy-nine places, typhoid-fever at fifty-eight places, and measles at twenty-two places.

Reports from all sources show diphtheria reported at four places less, scarlet-fever at three places less, typhoid-fever at five places less, and measles at thirty places less in the month of August, 1891, than in the preceding month.

Detroit, 220,000 : During August, deaths, 461—under five years of age, 125. Death-rate, 24.67. From zymotic diseases, 174; from consumption, 38, and from pneumonia, 16.

MISSOURI.—*Kansas City*, 132,416 : Deaths during August, 132—56 under five years of age. From zymotic diseases there were 33 deaths, and from consumption, 13. Annual death-rate per 1000, 11.9.

St. Louis, 460,000 : Deaths during August, 741—299 under five years of age. From zymotic diseases there were 183 deaths, and from consumption, 59. Annual death-rate per 1000, 19.33.

NEW JERSEY.—*Paterson*, 78,358 : Deaths during August, 184—91 under five years of age. Death-rate, 22.6. Deaths from zymotic diseases, 53 ; from consumption, 18.

NEW YORK.—The Eleventh Annual Report of the State Board of Health, for 1890, consists of two volumes, aggregating 935 pages, and interspersed with numerous diagrams and maps. The report opens with a condensed summary of the health of the State, followed by investigations of and reports upon the subjects in conflict with it. The number of deaths reported during the year was 117,100. Adding to these the probable number of deaths which occurred in towns failing to report, which at the rate of 16 deaths per 1000 population would amount to 800, making the death-rate of the entire population of the State 19.65. The returns for the first month in the year showed upward of 13,000 deaths from epidemic influenza, an excess of 5000 for that month above the annual average mortality for the preceding five years, and 2000 more than occurred in July, which is always a month of high mortality, on account of diarrhœa.

The zymotic mortality as a whole was low—3.51 per 1000 of population—the lowest for four years. Diphtheria seems to steadily decline, causing during the year 4915 deaths, a little less than 45 deaths per 100,000 population ; the largest death-rates from it were in the localities where the population was the most dense. Typhoid-fever caused 1612 deaths, less than in either of the two next preceding years ; and there was no report of its special prevalence at any locality during the year. Scarlet-fever was less prevalent than for several years, the number of deaths from it being 913. Measles was of variable prevalence, in some months causing one per cent of

the total mortality, and in others 17 per cent ; the total number of deaths from it during the year was 1161, a slight increase over the previous year. From whooping-cough the number of deaths was 1156. From small-pox the number of deaths was but 4.

From consumption there was a slightly smaller ratio of deaths than usual—118.37 per 1000 deaths from all causes. From acute respiratory diseases the number of deaths was 18,000, greatly in excess of previous years—attributed to influenza. Two special investigations were made during the year, by order of the governor—Barren Island and the Glen Cove Starch Works. Both localities were shown to be very malodorous to their respective neighborhoods, as they have been shown to be in previous investigations by the State Board, and in so far persistent nuisances despite the investigations and recommendations for their abatement. Means of abatement are again recommended by the Board, and have since been initiated ; but the proprietors of both places are of bad repute with their neighbors ; and the time since this last investigation is too short to inspire confidence.

Six plans for the sewerage of as many villages, and more than as many reports upon the sewerage of other places ; and reports upon rules for the protection of the water supplies of several communities follow. There are, besides, several shorter reports on special subjects—on the outbreaks of diphtheria and other sickness ; the duty of clergymen and magistrates to return marriage certificates ; the power of boards of health to fix the compensation of health officers and others ; and the reports of the Food and Drug Inspectors, Professors W. G. Tucker and G. C. Caldwell. Professor Tucker reports that of 543 samples of 26 different pharmacopœial drugs, preparations, and chemicals examined during the year 1890. There were of :

Good quality, 218, or 40.2 per cent ; fair quality, 90, or 16.6 per cent ; inferior quality, 182, or 33.5 per cent ; not as called for, 25, or 4.6 per cent ; excessive strength, 28, or 5.1 per cent.

“ These percentages, however,” he says, “ by no means represent the proportions of good, bad, or indifferent drugs on the market and on sale at the stores, since only those arti-

cles which were considered likely to be adulterated or known to be frequently of inferior quality were collected. Had samples of drugs and pharmaceutical preparations been selected at random, the proportion of pure and good articles would have been very much larger. The samples wrongly sold and reported above as 'not as called for' consisted chiefly of common safflower sold for real saffron, and the articles reported as of 'excessive strength' were mainly diluted acids, which were 25 per cent or upwards too strong; in some cases the concentrated acids being dispensed when the diluted were called for."

Professor Caldwell's report is chiefly upon the results obtained by an analysis of the alkaloids and the tincture of opium. Of 286 samples examined, 32.2 per cent were condemned. Of 20 samples of hypodermic tablets of sulphate of morphine, 65 per cent were condemned; of 70 samples of tincture of opium, 67 per cent were condemned; and of 166 samples of quinine and citrate of iron and quinine examined, 24.2 per cent were condemned. "Madame A. Rupert's (trade mark) Face Bleach," on examination, was found to contain 22.3 grains of mercuric chloride in one bottle of about six ounces' capacity. Yet, by the directions, this poisonous solution of corrosive sublimate is stated to be "harmless," and that "it usually requires three bottles of Face Bleach to thoroughly clear the complexion."

Taken altogether, the report is replete with information of practical utility to the people of the State, and worthy of the widest possible dissemination.

NORTH CAROLINA.—*The Bulletin of the State Board of Health* reports the following: In eleven towns, with 39,808 white and 39,562 colored inhabitants, there were during the month of July 61 deaths among the whites and 69 among the colored; the respective annual death-rates were 18.4 and 24.6. Deaths under five years of age numbered 40.

There were 32 deaths from diarrhœal diseases, 11 from consumption, 2 from pneumonia, and 5 still-born.

Wilmington, 21,000: Total deaths, 39—10 under five years of age. Annual death-rate, 22.3 per 1000.

Raleigh, 15,000: Total deaths, 32. Annual death rate, 25.6 per 1000.

OHIO.—*Cincinnati*, 300,000 : Deaths, 493—under five years, 176 ; from zymotic diseases, 112. From consumption, 58. Death-rate, 19.72.

Columbus, 88,000 : Deaths, 114—37 under five years ; from zymotic diseases, 40. From consumption, 16. Death-rate, 13.41.

PENNSYLVANIA.—*Philadelphia*, 1,069,264 : In the five weeks ending August 29th, there were 2244 deaths, of which 1092 were under five years of age. Annual death-rate per 1000, 21.8. From zymotic diseases there were 580 deaths, and from consumption, 210.

Pittsburg, 247,000 : Reports for five weeks ending August 29th, 604 deaths, of which number 331 were under five years of age. Annual death-rate, 25.42 per 1000. From zymotic diseases there were 218 deaths, and from consumption, 44.

RHODE ISLAND.—Thirteenth Annual Report of the State Board of Health for 1890, and Report upon the Registration of Births, Marriages, and Deaths for 1889, pp. 202 and 249. The State is reported to have been unusually exempt from epidemic diseases during the year. Three only of ordinary occurrence—diphtheria, measles, and typhoid-fever.

Diphtheria was epidemic in Smithfield, and largely prevalent in two other towns. The number of deaths from it was 211. Measles prevailed epidemically in Bristol, East Providence, Warwick, Hopkinson, North Kingstown, and Westerly ; the number of deaths from it was 92. Typhoid-fever had epidemic prevalence in Burrillville only ; deaths from it, 107. The influenza, or "la grippe," prevailed throughout the State ; the number of deaths reported from it, primarily, during the first three months of the year was 509.

The general results of registration during the year 1890 are as follows :

Births, 8850—one to every 40.4 of the population, or 24.7 per 1000. Marriages, 3195—one in every 54.1 of the population, or 18.5 per 1000. Deaths, 6934—one in every 50 of the population, or 20.1 per 1000.

The percentage of deaths from zymotic diseases to the total number from all causes was 25.38—3.30 per cent greater than in 1889.

The number of deaths from consumption during the year was 852—12.27 per cent of the total mortality, 6934.

The registration report for 1889: Births (besides 329 still-born), 8220; marriages, 3029; divorces, 274; the number of divorces applied for was 366—62 more than during the preceding year, and the number granted was 50 more. The proportion of *divorces granted* in 1889 to the whole number of marriages during the year was one divorce to every eleven and less than one tenth marriages. Deaths registered, 6259—335 less than in the previous year, and 81 less than in 1887. The death-rate was 19—1.4 less than in 1888. 32.3 per cent were of children under five years of age; 264 were caused by diphtheria and croup; 666 by diarrhœal diseases; 143 by typhoid fever; 460 by heart diseases; 743 by acute lung diseases, and 767, or 12.25 per cent of the total, from consumption and tuberculosis.

TENNESSEE.—The principal diseases, named in the order of their greater prevalence, in the State for the month of August were: Malarial fevers, dysentery, diarrhœa, cholera infantum, cholera morbus, tonsillitis, rheumatism, consumption, catarrh, bronchitis, and pneumonia.

Chattanooga, 30,000: Total deaths, 31—33 colored. Annual death-rates, 18.60 white, 39.60 colored per 1000.

Knoxville, 43,706: Total deaths, 25—18 colored. Annual death-rates, 8.63 white, 24.13 colored per 1000.

Memphis, 60,000: Total deaths, 161—67 colored. Annual death-rates, 22.17 white, 29.77 colored per 1000.

Nashville, 76,309: Total deaths, 173—82 colored. Annual death-rates, 18.44 white, 34.11 colored per 1000.

WISCONSIN.—*Milwaukee*, 230,000: Deaths reported during August, 503, of which 177 were under five years of age. Annual death-rate, 26.24 per 1000. From zymotic diseases there were 201 deaths, and from consumption, 27.

THE FRENCH BIRTH-RATE AND DEPOPULATION.

The Diagnosis.—The French census of 1886, the last that has been taken, showed an increase of 564,955, or 0.3 per cent, on the returns of 1881. In Germany the rate of annual increase is 0.7 per cent; in Belgium, 0.9; in Spain and Italy,

o.6. Moreover, in France the birth-rate is diminishing, so that it will not be long before the death-rate will exceed the birth-rate. In 1856 the childless families constituted 17.3 per cent of all families; in 1886, 20 per cent. The unmarried adults in 1856 composed 10.4; in 1886, 14.4 per cent. Patriotic Frenchmen—statesmen and philosophers—know what these figures mean, just as a physician knows the meaning of decreasing nutritional power in his patient.


The Treatment.—The forms of treatment proposed are many; all depend upon the special etiology ascribed to the disease by the friends of the patient. Sexual immorality is by some thought to lie at the bottom of the mischief; by others the blame is laid upon the law of inheritance; by still others, to the use of tobacco, etc. Monod, Director of the Public Health, says that proper and feasible sanitation would certainly save 130,000 lives annually. Brouardel holds the State responsible for 14,000 lives annually sacrificed because vaccination has not been made compulsory. All, however, are agreed that the State shall be called in as physician-in-charge. Taxation of bachelors, rewards to fathers of large families, and many like proposals do not seem to reach the root of the matter. With a sublime indifference to the ethical aspect of the question—nay, even with most noteworthy encouragement of sexual immorality, the French Academy has offered its services as consultant, and at its last meeting unanimously, *and with applause*, passed the following resolution:

“That in each department there shall be established at least one asylum for the care of pregnant women during the last months of gestation; that if she wishes it each woman shall be so cared for that absolute secrecy shall be preserved as regards her entrance, stay, and delivery in the establishment, and as to her departure from it; that all administrative inquiry as to the place of residence and identity of the patient shall be interdicted; and, finally, that financial aid shall be given to such women as from insufficient means are unable to bring up their children.”

In encouraging illegitimacy, the Academy evidently accepts the Jesuit maxim that the end justifies the means, and is also of the opinion that quantity is of far more value than quality. To an outsider it all appears more like stimulation than nutrition, and we hesitate about giving a definite prognosis.—*The Medical News.*

EDITOR'S TABLE.

Removal.—A. N. Bell, M.D., the Editor hereof, has changed his residence from 113a Second Place to 291 Union Street, Brooklyn.

 ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, Brooklyn, N. Y.

DR. SHAKESPEARE'S REPORT.*—Notwithstanding the general impatience of the medical profession, and of sanitarians in particular, with Dr. Shakespeare, for what has appeared to be his long-delayed report, no one with a just appreciation of the amount of scientific research and literary labor necessary to produce such a report as he now submits can justly charge him with either the want of assiduity in the performance or comprehensiveness in the detail of the work to which he was assigned by special commission of the President, October 1st, 1885. It is now, at least, abundantly evident that his letter of instructions at that time to "proceed to Spain and other countries in Europe where the cholera exists, and make investigation of the causes, progress, and proper prevention and cure of the disease, in order that a full report may be made of them to Congress *during the next ensuing session*," was an utter impossibility. (The italics are the editor's.) This, Dr. Shakespeare discovered at the outset. Moreover, he found it necessary not only to equip himself with new instruments, but to gain practical knowledge of their use in order "to make investigation of the causes, progress . . . prevention and cure of the said disease," from those who had preceded him in such investigations abroad—the United States, unfortunately, not affording any facilities for the prosecution of such studies. And ere he had properly equipped himself with a travelling laboratory and had made himself familiar with its use, by the aid of Drs. Robert Koch and Georg Gaffky, in the Pathological Laboratory of the Imperial Board of Health at

* Report on the Cholera in Europe and India. By Edward O. Shakespeare, A.M., M.D., Ph.D., of Philadelphia, United States Commissioner. 4to, pp. 970. Washington : Government Printing Office.

Berlin, the cholera was receding from Spain into Italy. He diligently followed it, however, availing himself of every opportunity by the way ; and when he had exhausted the resources of his following in Europe, realizing that he had but just begun the work of his mission, he sought and obtained an extension of his field, to proceed to India that he might obtain knowledge of the disease under its staid conditions at its common habitat. He arrived in India early in June, 1886, where he was almost immediately prostrated with fever and disabled for a month, but he subsequently pursued his purpose, gained a large amount of information from residents in addition to his own observations, and departed thence, two months subsequent to his arrival, for the United States. He reached his home in shattered health in the autumn of 1886.

The result of his work since that time is a quarto volume of nearly 1000 closely printed pages, comprising, besides, 105 illustrations, most of which were made from photo-micrographs of his own drawings, and some of them by microscopic lenses of his own construction ; and for the execution of this work he found himself obliged to acquire the art of photography, because he was unable to get any one to do it for him. Numerous charts and analytical tables of cholera statistics are also incorporated, showing the prevalence and course of the disease in the countries where it has prevailed. Insomuch that the wonder is, not that he has been so long in accomplishing the work which, according to the letter of instructions from the State Department, he was expected to do in one year, but that he has been able to do so much even in five years.

Altogether, the work is a mine of practical information on the nature of cholera and the means of restricting it, though not of wholly preventing it. It will doubtless continue to exist, as it has hitherto existed, in countries and among communities where the people are ignorant of or purblind to the poisonous emanations from their own bodies when permitted to commingle with their food and drink, as in India ; and other people and communities will continue to be in danger of contracting the disease proportional with their approximation to like local conditions and commerce with those who maintain them.

THE RESTRAINING MERCY OF EXCESSES.

MY DEAR DR. BELL: Your essay on "The Beneficence of Disease" is somewhat in a line of thought I have been pursuing for some time. It was suggested to me in my long bed sickness, but I have not fully carried out the argument. I gave my skeleton essay the title "The Restraining Mercy of Excesses." I brought out some such ideas as these: A man breaks his leg; pain compels him to desist from using it, and so the calamity of pains leads him to his cure. The drunkard steeps in his potations until his stomach refuses and resents the abuse. In this interval comes in the silent and harassing hours of remorse, when his better self appeals to him to desist. He not only has time to reflect, but being disabled from pursuing his former gratification, he has deliberate time to reform. The prophet Jeremiah (2 : 19) expresses it when he says, "Thine own wickedness shall correct thee, and thy backslidings shall expose thee." You express it in the third paragraph, page 201: "We are corrected against the imprudence committed for future improvement in *ourselves*, not punished that others may profit by our example," etc.

The trend of your theme is interesting to me, for I am sure that my bodily afflictions have enabled me to turn with loving thankfulness to my Heavenly Father for showing me the mystery of suffering. How real it makes the twelfth chapter of Hebrews when one comes face to face with serious sickness! I read to a poor colored patient, who died soon after with the words in his mouth, "He is not ashamed to call us brethren" (Heb. 12). "Is that there, sir?" was the joyful surprise of the poor sufferer, who was in the agonies of cardiac orthopnœa.

Good-night, dear doctor; only wanted to drop you a line.

Yours very truly,

THOMAS P. WOOD.

WILMINGTON, N. C., Sept. 21, 1891.

WORSE THAN VIVISECTION.—The *Medical News* says: "There are few things occurring in our modern life more fitted to give one severe moral nausea than the outrageous facts, none too plainly exposed by a writer in the April number of the *Nineteenth Century*, in a description of the hideous

agonies suffered by cattle during their transfer from their prairie homes to the English abattoirs. It is plain that, far from exaggeration, the worst part of the matter is touched as lightly and with as little insistence as possible. It would seem impossible that men and women with the faintest remnants of humanity and kindness yet remaining in their hearts would, for the saving of a paltry penny or two per pound in their purchase of meat, command such things to be done. But, apart from these aspects of the question, one cannot forbear asking what may be the physiological effect of such meat upon the human organism. If the milk of an angry human mother or a sexually excited cow will, in a child, produce very serious illness, what may not be the effect of the eaten flesh of these animals, beaten as they have been, bruised, starved, trodden to death, stifled, the whole organism every moment for weeks a quivering mass of fever, pain, and passion? The writer of the article in question thus closes his story :

“ ‘ It was found impracticable to fatten up range cattle on their arrival in England, and, after a few days’ rest to allow them to recover from their fevered condition, all these cattle were sold for immediate slaughter. They were fat when they left the range ; at the end of their month’s journey they were not only reduced to mere frames, gaunt and narrow beyond belief of people who have seen cattle only in the fields and farm-yards of England, but with their sterns rubbed raw and swollen out of all natural shape, their legs also swollen and in many cases raw around the fetlocks, and with their hides scored with horn-marks. When one considers the amount of bruising which these external marks represent, and the way in which steers had been thrown about in the pens by the motion of the vessel, it is difficult to suppose that any of the little beef that is on them can be healthy human food. I can only suppose it is made into sausages.’ ”

“ It is greatly to the credit of our Government that the Secretary of Agriculture has issued the most stringent and detailed orders, which to some extent will lessen the horrors of the ocean passage.”

INCOMPETENT PRACTITIONERS.—The Secretary of the State Board of Health of Iowa has publicly declared his conviction

that habitual drunkenness constitutes "palpable evidence of incompetency," under the law, and therefore that he should be deprived of the privilege of practising his profession and his diploma be revoked. This declaration assumes high ground; and yet it will obtain the hearty approval of the profession at large, and of the people. A physician gifted with the highest attainments, even in their highest exercise, totally uninfluenced by all extraneous causes, is in a condition none too complete for the faithful discharge of his responsible duties, at the bedside of the sick or of the sufferer from injury.

If a physician, therefore, is so far oblivious to the duties and obligations which he owes to himself as such, to say nothing of his relations to his family, as to deliberately and habitually disqualify himself by the use of any intoxicating agent, he cannot act with wisdom and due discrimination; consequently, his power and privilege to practise in any and every instance should be taken from him. He has violated the unwritten contract to render to his patient his services in the most approved manner recognized by the profession. He becomes a dangerous man; his abilities for injury to his patient are vastly increased by reason of his knowledge, which may be grossly perverted and fatal results follow. He should, therefore, be deprived of legal power to do harm in any instance. (See Code, Art. 1, Sec. 2, last clause.)

GEORGIA, too, by recent act of the Legislature, declares that when a doctor is convicted of drunkenness he can no longer practise medicine in that State.

MEDICAL TRAINING FOR BUSINESS.—A correspondent of the *Medical Age* says: "I have endeavored to keep track of one hundred of my medical friends after graduation, especially of what they did during the first five years, and find nearly seventy-five per cent had to resort to other employment to make a living. Twenty-three received a salary either in addition to practice or separate therefrom. Fifteen were proprietors of drug stores. Three were insurance agents. Four loaned money. One sold real estate. Three were connected with medical journals. One was an agent for drugs.

One was an agent for books. One preached. One was in the patent medicine business. Two were farmers. One was a manufacturer. Two gave massage treatment. One sawed wood, and subsequently suicided. Twelve gave up in disgust, and one never tried practice at all. Twenty-nine graduates only in one hundred exclusively devoted themselves to medicine, and of these eleven associated themselves with other practitioners, and in many cases fell heir to their practice."

DR. MAX RUBNER, Director of the Hygienic Institute at Marburg, has been appointed to succeed Dr. Robert Koch as Professor of Hygiene in Berlin. He was born at Munich in 1854, established himself as a private lecturer in the University of Munich in 1883, was appointed extraordinary professor at Marburg in 1885, and ordinary professor in 1887. Koch has resigned his official positions in order to take the direction of the Institute of Infectious Diseases which has been organized by the German Government. It is stated that the Academic Senate will bestow an honorary office upon him, and that this will permit him to lecture whenever and wherever he pleases.

IMMIGRANTS of all nationalities in the United States during the twelve months ending June 30th, 1891, 555,496. For the corresponding period ending June 30th, 1890, 451,219, and for 1889, 438,619. It will be seen from these figures that the number is steadily increasing.

AQUARIUM CEMENT.—Mix together litharge and glycerine to the consistency of thick cream or fresh putty. This cement is useful for mending stone jars or any coarse earthenware, stopping leaks in seams of tin pans or wash-boilers, cracks and holes in iron kettles, etc. It may also be used to fasten on lamp-tops, to tighten loose nuts, to secure loose bolts whose nuts are lost, to tighten loose joints of wood or iron, loose boxes in wagon hubs, and in a great many other ways. In all cases the article mended should not be used until the cement has hardened, which will require from one day to a week, according to the quantity used. This cement will resist the action of hot or cold water, acids and heat.

LITERARY NOTICES AND NOTES.

INDEX-CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, UNITED STATES ARMY. AUTHORS AND SUBJECTS. Vol. XII. REGER—SHUTTLEWORTH. By JOHN S. BILLINGS, Surgeon U. S. Army. Washington: Government Printing Office.

This volume is uniform with the eleven other volumes of the series which have preceded it, a work of unequalled excellence and inestimable utility to all who are interested in the authorship of medical literature.

It includes 20,251 author titles, representing 8022 volumes and 18,090 pamphlets. It also includes 6603 subject titles of separate books and pamphlets and 18,956 titles of articles in periodicals.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES. A YEARLY REPORT OF THE PROGRESS OF THE GENERAL SANITARY SCIENCES THROUGHOUT THE WORLD. Edited by CHARLES E. SAJOUS, M.D., and seventy associate editors, assisted by over two hundred corresponding editors, collaborators and correspondents. Illustrated with chromo-lithographs, engravings, and maps. Fourth series, 1891. Five volumes, 8vo, pp. about 3000. Subscription price (including *The Satellite*) yearly, in cloth, \$15; half Russia, \$20. Philadelphia: F. A. Davis.

To the busy medical practitioner who would keep abreast with the progress of medicine in all its branches, this is unquestionably one of the most useful works issued by the American press. It comprises the gist of current medical literature, gleaned and condensed by such practitioners as are, for the most part, distinguished by their competency in the special departments of medicine into which the work is divided.

Of the subjects and editors, as classified in Volume I., for example, may be mentioned: Diseases of the Lungs and Pleura, by Professor James T. Whittaker, of Cincinnati; Diseases of the Digestive Organs in Children, by Professor L.

Emmett Holt, of New York ; Fevers, by J. C. Wilson, A.M., M.D., and Professor Solomon Solis-Cohen, of Philadelphia ; Diphtheria, Croup, Pertussis, and Parotitis, by Professor J. Lewis Smith, of New York ; and a dozen or more of other groups of diseases, by men of like celebrity. Volume V., which comprises therapeutics, climatology, balneology, hygiene, epidemiology, embryology, anatomy, and physiology, is by Drs. J. P. C. Griffith, W. H. Cattell, A. D. Rockwell ; Professors Hobart A. Hare, George H. Rohé ; Surgeon-General John B. Hamilton, and Surgeon Wyman, U. S. Marine Hospital Service, and as many more of like distinction in the several departments to which this volume is appropriated. The same may be said of the other volumes and of the work as a whole ; it is replete without redundancy, admirably gotten up by the publisher, and commendable to the medical profession.

THE METAL WORKER ESSAYS ON HOUSE HEATING, BY STEAM, HOT WATER, HOT AIR, AND COMBINATION SYSTEMS, WITH INTRODUCTION AND TABULAR COMPARISONS. By A. O. KETRIDGE, editor of *The Metal Worker*. 8vo, pp. 250, with numerous illustrations. Price, \$2.50. New York : David Williams. A prize work, by competitive essayists, of practical experience in the application of the several systems discussed.

The number and excellence of the fifteen essays, and of the eight in particular—two on each one of the systems—for which prizes were awarded, comprised in the volume, constitute it one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day, written by persons who adopt theories, and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it.

WHAT TO EAT AND HOW TO SERVE IT. By CHRISTINE TERHUNE HERRICK. 12mo, pp. 309. New York : Harper &

Brothers. It is difficult to conceive anything better calculated to promote good health and domestic happiness in the household than good food properly cooked and well served ; indeed, none is good that is otherwise ; and to all who would acquire such knowledge, and to young housekeepers in particular, we earnestly recommend this book.

HOW AND WHAT TO FEED THE BABY, in the October number of *Demorest's Family Magazine*, tells what food to give, how to prepare each kind, just how much and how often the child should be fed, when and how often the diet should be changed, and gives bills of fare for different ages, so that the most inexperienced mother may know just how to feed her baby from its birth until it is able to eat the regular meals of the family. This is only one of the many attractions of the October number of this comprehensive family magazine, which is bright with charming stories, finely illustrated, by distinguished writers. Price, 20 cents. W. Jennings Demorest, 15 East Fourteenth Street, New York ; and for sale by all newsdealers.

PULMONARY CONSUMPTION A NERVOUS DISEASE : Considered as such from a practical, a clinical, and a therapeutic standpoint. By THOMAS J. MAYS, M.D., Professor of Diseases of the Chest, in the Philadelphia Polyclinic and College for Graduates in Medicine ; Visiting Physician to the Rush Hospital for Consumptives of Philadelphia ; Fellow of the College of Physicians of Philadelphia ; member of various medical societies, etc. Physicians' Leisure Library Series, issued monthly, \$2.50 a year ; 25 cents a copy. Detroit, Mich. ; George S. Davis.

A halt to the deductions from, if not, indeed, to the bacillus tubercle theory itself, is the purport of this book. But, confessedly, the author had committed himself to the nervous origin of consumption before the bacillus theory was enunciated. That he has, therefore, watched the rise and fall of the theory so directly in conflict with his own with more attention than common to students whose previous conceptions were wholly unembarrassed, is both natural and reasonable ; and the more, since the discovery of the tubercle bacillus has not,

so far as that discovery is related to therapeutics, at least, led to any useful results.

The author maintains the neurotic theory of the disease by pointing out its relationship to the depressing influence of excesses of all kinds—unsanitary conditions and occupations, feeble parentage, hysteria, insanity, epilepsy, diabetes, and all sorts of constitutional cachexia, brought about by heredity or otherwise; and not unfrequently to acute disease of the pulmonary organs, above all, to pneumonia; insomuch that he raises the question “whether pulmonary consumption, from its beginning, is a separate and distinct pathological entity at all, or whether it is slowly evolved out of pre-existing pulmonary disease?”

A considerable amount of statistical information is adduced and numerous authors cited from what was written before Koch's discovery, in support of the neurotic theory, and its frequent curability when so viewed and treated.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS, for September number, are: Foods and Dietaries: A Manual of Clinical Dietetics, by R. W. Burnet, M.D., and Stertor, Apoplexy, and the Management of the Apoplectic State, by Robert L. Bowles, M.D. That on Foods and Dietetics particularly is replete with practical knowledge of the highest importance to every physician. Besides a full consideration of the kind of foods required in the treatment of particular diseases, the chapters on Alcohol, Prepared and Predigested Foods, and Sick-Room Cookery are especially pertinent to the still open question on the medicinal qualities of alcohol, the superabundance of prepared foods, and the importance of proper cookery—subjects which no physician can afford to neglect. \$10 a year; \$1 a number. William Wood & Co., New York.

TABLES FOR DOCTOR AND DRUGGIST, compiled by ELI H. LONG, M.D., Professor of Materia Medica, Buffalo College of Pharmacy; Adjunct Professor of Materia Medica, Medical Department, University of Buffalo. 8vo, pp. 103. Price, \$2. Detroit: George S. Davis. A manual of great utility to all who think it safer to have at hand a ready reference to the proper-

ties, doses, and uses of medicines—particularly of poisons and their antidotes—than to wholly rely upon the memory.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK, 1891, Dr. F. C. CURTIS, Secretary, Albany, is an octavo volume of 568 pages, comprising 54 stated papers and discussions, besides reports of committees and obituaries, of interest and practical utility to all medical practitioners.

PROCEEDINGS OF THE CONNECTICUT MEDICAL SOCIETY, 1891, Dr. N. E. WORDEN, Secretary, Bridgeport, is a pamphlet of 346 pages, comprising twenty-eight papers, addresses, and committee reports, two of which are of special interest to sanitarians—the address of Dr. Melanchthon Storrs, the president, on School Sanitation, from which an extract was published in our August number; and the Disposal of Sewage, by Edward K. Root, M.D., of Hartford, who gives a concise review of the subject generally, as practised in European cities, as well as American, in connection with a special report upon the bad practice of polluting Piper's Brook, at New Britain, in his own State, and the litigation required to put a stop to it.

PAMPHLETS, REPRINTS, REPORTS, ETC., RECEIVED.

Agricultural Reports Cornell University Experiment Station :

Bulletin 28 : Experiments in the Forcing of Tomatoes.

29 : I. Cream Raising by Dilution. II. The Effects of a Delay in Setting on the Efficiency of Creaming. III. Application of Dr. Babcock's Centrifugal Method to the Analysis of Milk, Skim-milk, Buttermilk, and Butter. IV. The Relation of Fibrin to the Effectual Creaming of Milk.

30 : Some Preliminary Studies of the Influence of the Electric Arc Lamp upon Greenhouse Plants.

Bulletin of the American Academy of Medicine, August, 1891, Charles McIntire, Secretary, Easton, Pa.

Aristol : W. H. Schieffelin & Co., New York.

Cancer of the Cervix Uteri, with Pyo-Physometra : Howard H. Kelly, M.D., Johns Hopkins University, Baltimore, Md.

THE SANITARIAN.

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NUMBER 264.

WOOLLEN OR LINEN?

By R. C. RUTHERFORD, New York.

II.

ON returning from our summer vacation, we find upon our desk, *The Irish Textile Journal*, (July 15th, 1891,) with two articles having some reference to our article on *Woollen or Linen*, reprinted from the May number of the *SANITARIAN*. One is "by J. L. Milton, London, Senior-Surgeon to St. John's Hospital for Diseases of the Skin;" the other we take to be an emanation from the editorial pen.

The editor, evincing a peculiar faculty of "extracting honey from the weed," sets out as follows :

"If the Jaeger circular with the inconsequent title, to which we paid some attention last month, could be considered a compliment to our linen articles, how much more flattering must a pamphlet of twenty-nine solid pages be? [!] We make our grateful acknowledgments for a publication of that encomiastic extent, professedly issued as 'A Review of certain Articles (editorial and contributory) in the *Irish Textile Journal*, by R. C. Rutherford, New York,' and reprinted from the *SANITARIAN*."

It is only the "encomiastic extent" (whatever this is) of our article, that he lays as a flattering unction to his soul. He evidently finds no relish of salvation in the substance of it. Nor would he contemplate its "encomiastic extent" so complacently, if he would recall to mind the fact that it is sometimes easy to assert in a line what it may require volumes to refute—especially when the refuting argument is to be scaled by the weight of authorities. It might also detract a little from his ecstasy, if he would recall to mind his assertion that, "as a matter of personal health and convenience, the con-

demnation of wool by professional men is complete." Viewed from this stand-point, our twenty-nine pages of adverse authorities may not seem so very flattering to him.

We are certainly treating a serious subject. But there is some temptation to swerve from this vein in dealing with a writer that uses a question mark for an exclamation point, and measures encomiums by the yard.

We thank the editor for crediting us with the ability to talk as we write. We much prefer doing that, to blundering into obscurities and contradictions for the sake of variety in language. We wish our editor would, not only talk as he writes, but write in one place as he writes in another, when professing to write the same thing. It is easier for most choppers of logic, as well as choppers of wood, to strike twice in two places than twice in one. We are also pleased that the editor takes "the pamphlet for consideration rather than the article." But we confess that we do not understand his reasons for the preference; namely, "It is longer, for one thing, and more open, for another." What its *length* or *openness* could have to do in determining his choice, is a mystery to us. Indeed we do not know what he means by saying that "it [the pamphlet] is more *open*." Does he? Of the full forty meanings pertaining to this word, we know of none that is not as applicable to the article as to the pamphlet. A person who writes with so little regard for that rule of rhetoric that excludes ambiguous language, when there is the privilege of choice, may be expected to say a good many things that will not bear strict construction. It is this slipshod method that must be held responsible for this rejoinder, the main object of which is to correct some of the misstatement in the two articles devoted to the "consideration" of our pamphlet. Even these corrections are necessary for those only who have, perhaps, neither opportunity nor inclination to compare our respective papers. With a comparison of them, by the reader, we should be content without another word.

To this task we shall give such time as we can get in and out of our regular working hours.

First, a word about "style," particularly about *our* style, which does not seem to command the unqualified admiration of either the editor or his right-hand supporter, the Senior-

Surgeon, "Mr. Milton." Frankly, we confess to no pretence of cleverness in that particular. Our constant aim is at clearness and truth. If, in our partiality to fact, we unwittingly slight the form, may not the greater importance of the former be urged in extenuation of the offence? Respecting the *matter*, it is some gratification to know that we have not been misunderstood, nor, in any particular, refuted, either by the editor or his colleague, the "distinguished practitioner."—This phrase reminds us that we are specifically charged with "bad taste in writing about a distinguished practitioner as 'a Mr. Milton.'" The editor says: "The expression was not taken from our pages, as the quotation marks would signify." Now, the editor will permit us to say, that, abating the indefinite article *a*, inadvertently included in the quotation, "the expression" *was* taken from his pages. That, in any case, the "a" was not intended as a slur, is evident from the fact that the Surgeon was named by that title throughout our article, excepting only one or two instances in which he was mentioned in connection with some passage from *The Textile Journal*. In our ignorance of English distinctions, we thought it singular that the appellation *Mr.* should be applied to a "distinguished practitioner," who is also the Senior-Surgeon of a hospital. Despite the precedent of the continued use of it by the editor, we preferred the more distinctive title, as "our pages" show. There is something suggestive of "Mawmee potatoes," in the adverse criticism based upon an obviously accidental misplacement of this little article *a*.

Now let us notice, as briefly as possible, the editor's answer, to our last paragraph on page 3rd of our pamphlet.—To a series of questions, the pivotal one of which is, "Does he not know that whatever promotes the general health, is, *pro tanto*, a specific for any special disease, and a preventive of it," he replies: "Of course we admit all this, in moderation—should not think of denying it."

That is frank and fair; though, we do not quite see, if he admits it *all*, where the "in moderation" is to come in. There is, indeed, no "in moderation" about it. He admits it all—does not think of denying it or any part of it. Then he adds:

"But that is not to say that either Jaeger shirts, Jaeger sheets, Jaeger collars, cuffs, handkerchiefs, or Jaeger pajamas, etc., will produce these effects, or prevent the contrary evils."

True, it is not to say that "either," or any one of these things, "will produce these effects," or, to return to the real question, "promote the general health." But what we ask the editor to admit or deny, without equivocation or substitution, is, do some or all of these things, worn or used according to the teachings of Dr. Jaeger, tend *more* to produce these effects, or to promote the general health, than the linen fabrics advocated by the editor and Senior-Surgeon Milton? This is the mark that the editor does not appear willing to toe. How far from this he prefers to stand, may be seen from the following, coming close upon the heels of his comprehensive admission :

"Let us, please, carry this matter a little farther. Will Dr. Rutherford stake his reputation on the other conclusions of Dr. Jaeger? Does he believe that any vegetable dye will make animal fibre dangerous? will he interdict all vegetable woods and all vegetable wall-papers in dwelling-houses? can he credit that the wearing of moccasins of tawed stag's leather by the Indians in North America has had anything to do with making them swift-footed? will he hold that it is essential to health that a purse carried in the pocket must be either of wash-leather or knitted wool? will he maintain that a man can run three times farther in a brown suit than a blue one—that fragrant odors induce a feeling of warmth—that injurious results will follow on the use of a pipe with a stem of vegetable fibre—or that it is detrimental to health to read from books of vegetable fibre paper? If he can pledge his allegiance to these assertions, and rest his convictions and reason on these conclusions, we shall know what to think of him. If he will not pin his faith to these positive statements—many of them avowedly based on Dr. Jaeger's experience, some on his deliberate experiments—then we shall know what to think of the System."

Properly to estimate the significance, or, rather, the *insignificance*, of these words, the reader must bear in mind that our article in the *SANITARIAN*, republished in pamphlet form, was prepared, not to prove any proposition, theory, dogma, doctrine, tenet, or belief of our own, but to refute the position of the editor of *The Irish Textile Journal*, that, from the stand-point of "*authorities*," the opinion of a hospital surgeon, based upon a fifteen years' experience with linen, as a dressing for skin diseases,—as to the suitableness or preferableness of linen to wool for underclothing, *to be worn next the skin*, is conclusive, or, we might have added, to be accounted as a drop in the bucket, against the counter authori-

ties. We took the ground that the analogy of nature afforded conclusive proof of the "foundation fact of the Jaeger System;" namely, that "a material provided by nature for the clothing of an animal body, is the most suitable material for the clothing of the animal, man." To this point—the essential one—all the authorities of our twenty-nine pages were made to converge. From under this mass of overwhelming testimony, our supple editor strives to extricate himself by construing it into a "compliment to our [his] linen articles." Then, getting to his feet again, he looks bewilderedly at the avalanche, and says: "Let us, please, carry this matter a little farther."

The meaning of which, without straining the license of interpretation, is: "*I don't quite like the looks or the odor of this issue, as it now shows up; let us get up another one.*" "Will Dr. Rutherford stake his reputation [for what?] on the other conclusions of Dr. Jaeger?"—That is, will Dr. Rutherford be so obliging as to permit us to abandon the issue we ourselves have made for him, and commit himself to a lot of propositions, which, to the ignorant and illiterate, may be made to appear extravagant, or absurd and ridiculous?

We have cited the entire paragraph of interrogatives, which the editor is pleased to call the "positive statements," or "other conclusions," of Dr. Jaeger. Now, "if he [Dr. R.] can pledge his allegiance to these assertions, and rest his convictions and reason on these conclusions, we shall"—what? What is to be the mighty prize tempting to the acceptance of this new challenge? What the momentous consequence? "*We shall know what to think of him.*" A most lame and impotent conclusion. *Parturiunt montes*—"you know the proverb."

"If he will not pin his faith to these positive statements . . . then [and not till then?] we shall know *what to think of the System.*"

Alas! for the world "and the rest of mankind," for Dr. Jaeger and his System, if what the Irish editor is to think of it hinges upon this uncertain *pinning* business. And, we may remark here, incidentally, speaking of "style," that, if the Irish editor will consult his dictionary, he will learn that he is

making a very unreasonable request of us in asking us to "pledge our allegiance to assertions." Were we not native to a land of individual sovereigns, we might owe and pay allegiance to some lord or king or other royal potentate; but not to rocks or stones or any other senseless thing, above all to a "positive statement" with an interrogation mark. Quite on a level with this absurd demand, is the editor's challenge to us to rest our convictions and reason upon conclusions. We would rather rest our convictions and conclusions upon reason, than adopt the "inconsequent" method which seems so much in favor with our editor. In general terms, we may say that we are not in the habit of pledging allegiance or pinning faith to anything. The better way is to prove all things and hold fast to that which is good. And it is quite immaterial to the public what the editor thinks of us. What we want is that he shall think right, and speak right, about this "Woollen or Linen" question. And yet, we may venture the opinion that there is nothing so tremendously bugbearish or appalling in these questions, as the editor seems to think there is,—excepting, perhaps, the "brown-suit-and-a-blue-one" question. Nay, we will consent to "carry this matter a little farther," and accept as defensible, *in the sense and to the extent* advocated by Dr. Jaeger, more of these implied propositions than our editor, on his reputation for scientific intelligence, dare deny. At any rate, we shall not presumptuously condemn a theory or conclusion that we are too indolent to investigate, or too ignorant to comprehend. We admit the existence of stars beyond our visual range. We shall not surrender our conviction that a woollen shirt is better than a linen one, because we cannot prove "that a man can run three times farther in a brown suit than [in] a blue one." We admit that Dr. Jaeger may know more about the things whereof he affirms, than we or the Irish editor, or all of us. At least, there is enough of his System comprehensible to us, to ensure conviction of the soundness of its general principles. But our pledging, or pinning, or thinking, or believing, has nothing to do with the question. The editor asserted his belief in the superiority of linen, as compared with wool, as a material of clothing to be worn next the skin, and vaunted the sufficiency of Surgeon Milton's authority to settle the

question. Here are his very words : " The position occupied so long by Mr. Milton, and his extensive practice, enable him *to speak with absolute certainty and authority upon such a matter as this ;*"—the italics are ours—and adds, in abominable English, " and his opinion outweighs any number of irresponsible and interested arguments preferring other fibres." So, the question is decided forever. Nothing now remains but—what? " It remains now for Belfast to make good use of *this valuable opportunity.*" As no such thing as opportunity has hitherto been mentioned, we supply the omission by supposing that the editor means the favorable opportunity, afforded by " Mr. Milton's" irreversible judgment, to push the linen business by " dogged advertising," etc.

Believing—and giving the reasons for believing—that these gentlemen were rashly importunate, in giving the public pernicious counsel ; and that, (as appeared from the *internal evidence,*) more out of solicitude for their friends of the Belfast linen trade, than for the public benefit, we undertook to show that Surgeon Milton's decision is far from being final, and that the " authorities" are overwhelmingly against the editor's and the Surgeon's advice and their fabric.

And now we see how these gentlemen meet, or, rather, try *not* to meet the testimony. The editor gives up more than a column to irrelevant prattle about compliments, style, bad taste, a plea for new issues, and a commendable confession of having been tricked into a misquotation and a misrepresentation of Dr. Shoemaker. The confession is frank and honorable ; and charitable, too, in that there is no suggestion of the lash for the " correspondent" who put him into this humiliating predicament. Respecting this latter affair, all we have now to say is, that, *without* this explanation, we did not put down a word characterizing the act, that was not fully warranted by the case as made up from his own record ; or that we are required to retract, but for the apology. An apology that will need be repeated, if the editor means to say that the " fault" was met by " charges of misrepresentation and unscrupulousness." The fact is that no such charges were made *by us*. Certain questions, warranted by the text, were asked ; questions which the editor was expressly called upon to answer. His answer we have in his *amende honorable*,

which we, as well as "those acquainted with the management of this [his] Journal" are bound to accept.

We now proceed to notice some of the more serious passages of the editor's article.

Respecting the question of "cleanliness," we have only to say that it is so much a matter of choice, opinion, habit, occupation, and even of temperament,—as to what constitutes the necessary measure of washing and bathing, we do not see any reason for modifying our paragraph, on that subject, in the pamphlet. It is not for us to say what will satisfy "British notions of cleanliness," or that the amount of washing that would keep Dr. Jaeger clean would suffice for the Belfast editor. There *are* stains and spots that the multitudinous seas, and all the soap in Christendom, cannot wash out. Of one thing we are confident, and that is, that our editor will not succeed in his "attempt" to show up Dr. Jaeger as an apostle of dirt.

Having made out a *prima facie* case seriously inculcating the editor in his treatment of Dr. Shoemaker, we put, alternatively, the question: "Or is he, the editor, acting the part of the unscrupulous attorney for the Irish linen manufacturers, because 'it is a matter of the first importance to Belfast?'"

Respecting this, he writes:

"Another grievous offence laid to our charge is, that, being 'the unscrupulous attorney for the Irish linen manufacturers,' we have an eye single to their interests," etc.

Of course, our editor does not mean to "confess so much" as the grammatical construction and logical interpretation of his words, declare. Admitting the unscrupulous attorneyship, he repels the charge, based upon it, of "having an eye single," etc. It is not the purpose here to hold the editor to his language; and we notice it only as another illustration of a shakly rhetoric, of which we have yet to see more serious examples, especially abounding in the paragraph under consideration. To us, it seems hardly parliamentary to quote these words—"the unscrupulous attorney," etc.—at all. It would appear to be the part of a fair-fighting debater, after withdrawing and apologizing for the premises on which an inculcating question rests, to refrain from further allusion to

it, or, at least, from holding the questioner responsible for it. —*Cessante causi, cessat effectus*. Surely, the rule is applicable here, unless the editor has some distrust of the claims of his apology to acceptance. The frankness and thoroughness of his retraction, not only entitle it to acceptance, but are equivalent to an admission that no denunciation could have been too severe had the "fault" been fixed upon him instead of his "correspondent."

Right in the wake of the above-given quotation, comes the following :

"With a measure of misrepresentation which is surprising, we are taxed with *gloating* over the gullibility of the public, and with urging others to trade upon it." (The italics in all these passages, unless otherwise noted, are ours.)

A little while ago, the editor, with something of a bristling-up, after a somewhat mortifying confession, wrote : " When it comes to fighting, we fight fair."

Is it fair to make a charge of *misrepresentation* without offering a word or syllable to substantiate it? Let us see how it is !

The editor, following right on from the above, says :

"It would be possible, *we wrote*, to push linen into favor which it might [may] not deserve on its merits, [;] and to persuade people into believing that it possessed particular virtues although it had them not. There have been cases in which such action has been successfully taken. What we have insisted upon is that there is *real good in linen*, and that there is good business to be obtained in letting people know about it."

There is certainly little pleasure, and probably as little profit, in the continuance of a discussion after it degenerates into the paltriness of a mere "You did," and "I didn't." Nevertheless, it is now impossible to refrain from contradicting this rash, intruding editor. To our knowledge, he never "wrote" the lines he now says he did. And what he now says he "insisted upon," is what nobody denies. About so obvious a truth there can be no difference of opinion ; certainly no controversy. The question is not, never has been, whether "there is real good in linen," *but which of the two*, woollen or linen, is the better material for clothing to be worn next the skin? This is the grindstone to which the editor of *The Irish Textile Journal* voluntarily put his nose ; and there we intend to keep it, so long as we have a hand at the crank. He may clamor about "vegetable dyes," "tawed stag's

leather," and the "difference between napery and linens for personal use," to his heart's content ; he will have the ring in that circus, and the audience, all to himself.

Now, as to this matter of "gloating over the gullibility of the public," with which the editor says we charged him.—On page 2d of our pamphlet is the following paragraph :

"Inflated with this idea of prospective thrift, the editor breaks out on another page to say that 'the pot must be kept a-boiling ;' 'this subject must not be allowed to rest or drop out of sight if any business benefit is to be derived from it.' There must be 'persistent application' based on the public gullibility, for 'If constant dropping wears away stones, dogged advertising may invest the bread-crumbs pill with amazing virtue ;' and 'It would be possible by judicious expenditure and vigilant pains, [such as "vigorous assaults on the home market," "dogged advertising," and "keeping the pot a-boiling."] to make the public believe in linen and buy and wear it, though flax had [have] no more virtue than any other fibre, and flaxen fabrics no more reputation than drugget or shoddy.'"

With the exception of a few words, this paragraph is made up of passages quoted from the editor's article, and in no respect do they pervert his words or misrepresent him. The words "based on the public gullibility" are ours, but fully warranted by the language quoted from the editor. That this collocation of his words does him no injustice ; that it does not, in the least, misrepresent him, here is the proof, in the full text :

"If constant dropping wears away stones, dogged advertising may invest the bread-crumbs pill with amazing virtue, and a glance at the newspapers at any time will show how empty must be the merits of many patent medicines which profess to cure the most varied disorders in the most haphazard constitutions. It would be possible, by judicious expenditure and vigilant pains, to make the public believe in linen, and buy and wear it, though flax had no more virtue than any other fibre, and flaxen fabrics no more reputation than drugget or shoddy."

If here is not the clearest intimation, that the public can be made to "believe in linen, and buy and wear it," through the same processes by which the "bread-crumbs pill" may be invested "with amazing virtue," both turning on the gullibility of the public, we do not understand the meaning of words. As the public can be gulled into believing in the amazing virtues of bread-crumbs pills, so, by the same token, "dogged advertising," etc., they can be made "to believe in linen," though it have no more virtue than drugget or shoddy or bread-crumbs pills. In the face of these words and facts,

will our editor try to purge himself of the opprobrium of having advised the linen manufacturers to avail themselves of the public gullibility, for the advancement of the linen trade ?

Recurring to the quotation above, in which the editor says : "What we insisted upon is that there is real good in linen," etc., we ask the reader to compare the following, with what the editor *now* says he "wrote," and what he "insisted upon."

"Meanwhile, we wish to direct particular attention to the admirable paper in which Mr. Milton advances further arguments, based upon his lengthened observation and experience, to show that we have in linen the best of all fabrics for health, ease, and satisfaction, not only of the utmost value in all skin diseases, but the most salutary and agreeable of any to make men healthy, and to keep them so."—*The Irish Textile Journal*, Feb. 15th, 1891, page 17th.

"It can be proved, by competent and trustworthy authorities, to be healthful, and, when once the wearer is habituated to it, is as grateful and comforting as a familiar cocoa. It is as fair to look upon as it is pleasant to use. Why should it be so far limited to damasks, huckabacks, and diapers, or mainly confined in personal use to masculine cuffs, shirts, and collars ? Why should not men wear linen suits, and ladies linen dresses ; why should not both sexes wear linen underclothing, and sleep in linen far more generally than they do ?"—*Ibid.*, p. 18th.

"But it is a part of our case that *wool is by no means beneficial to health.*"—Page 18th. "But as a matter of personal health and convenience, the condemnation of wool by professional men is complete ;" (page 18th ;) while "we have *in linen the best of all fabrics for health and satisfaction*, . . . the most salutary of any to *make men healthy, and to keep them so.*"—*Ib.*, page 17th.

"But the best stand-point from which linen can be upheld is that of its hygienic properties."—*Ib.*, page 19th.

And *this* is what the editor pretends to re-state in the words :

"What we ["wrote" and what we] have insisted upon is that there is *real good in linen*, and that there is good business to be obtained in [by] letting people know about it."

We continue the quotation from this long and curious paragraph :

"All this talk of selfish motives comes with a peculiarly bad grace from a Jaeger advocate. We do not pretend to run this Journal for our health, nor are Belfast people carrying on business for amusement, nor is the Dr. Jaeger's Sanitary Woollen System Company, Limited, trading on those principles either, as anybody can easily discover. Then, ignoring or neglecting to notice that these articles appealed to a manufacturing community, Mr. Milton is also twitted with putting mercenary considerations in the first place. His fifteen years' faithfulness [!] to Irish linen in his extensive practice is disregarded ; the expression of his confidence, more than once repeated, in the great gain to

public health which would follow upon the general wearing of linen, is not mentioned ; and Dr. Rutherford deliberately states that 'to aid the fabricators of linen to get their goods on the market in successful competition with the goods of the "Jaeger Sanitary Woollen System," which seems to threaten the very existence of the linen and cotton industries, seems to Surgeon Milton to be of infinitely more importance than the welfare of mankind in general.' The idea of Ulster and Lancashire being in jeopardy because of Dr. Jaeger is very funny, but the perversion of Mr. Milton's views and motives is anything but creditable. We may point out, too, that Dr. Rutherford chooses to remain in ignorance of the difference between linen napery and linens for personal use."

This is the first time we have heard any intimation or "talk of selfish motives." And we challenge our editor to put his finger upon a line or word of ours, that directly or indirectly imputes a selfish motive to either him or to Senior-Surgeon Milton. But, that the editor frankly confesses to that sort of motive, for himself and the "Belfast people ;" and, judging others by himself, imputes it to the Dr. Jaeger's S. W. S. Co., Limited, "anybody can easily discover" in the first five of the above quoted lines. That is all well enough, so far as he speaks for himself ; but it is neither fair nor just to charge us with the offence of accusing him of selfish motives, without a word to justify the accusation. And, when he comes to apologize for the mistake, would it not be a gracious thing to do, to take in the "preachers who," he says, at the very outset of his article, (Feb. 15th,) thus leading off in the motive-impugning business,—“who are content to tickle the ears of their congregation.” The occasion for such a daubing of the Cloth, is not apparent, and it comes “with a peculiarly bad grace from” one who winces so exceedingly at the bare imagination of a thrust at himself. What have the preachers done to sully his “linen” ? Possibly he did not mean what he said. Certainly, he sometimes says what he does not mean.—Take the third sentence in the last above-given quotation. By making “Mr. Milton” the grammatical subject of the participles *ignoring* and *neglecting*, the construction is, that, Mr. Milton, ignoring or neglecting to notice “that these articles appealed to a manufacturing community, is also twitted,” etc. Thus he puts upon Senior-Surgeon Milton, a sin of omission, which he evidently intends for some one else ;—whom, he nowhere says : and we may never know. But, if he means us,—and perhaps he does,—that we have so twitted

Dr. Milton, we shall have to tell him, in all gentleness and charity, that his charge is as false as his grammar.

In championing the cause of the Belfast linen manufacturers, Senior-Surgeon Milton may be actuated, for all we know, or even suspect, by the most unselfish and generous motives. It is not our fault that his language exposes him to the suspicion, that, in his opposition to the "flannel theory," and in his zeal for his friends, he overlooks the welfare of mankind in general; or that the fervor of his fancy should have led him into a disingenuous caricature of the Jaeger System. Of course, these things are not creditable to Senior-Surgeon Milton. And we so expressed ourself; and in still stronger terms, of his attempt to persuade the public to substitute linen for woollen underwear. It is these things that compel us to think him incompetent to go more than skin-deep into the woollen question; and that, by his weak arguments, he hurts his friends more than he could by observing a prudent silence.

And now, returning to our editor, we may say, after the disposal we have made of one charge of misrepresentation, that we shall not be expected to refute any other, unaccompanied with specifications—especially a charge so absurd as that of "perverting the *motives*" of another; or that of choosing "to remain in ignorance of the difference between linen napery and linens for personal use." Such a charge is presumptively unwarranted, and obviously untrue. The editor has no right to say that anybody chooses to remain in ignorance of anything. And what adds to the paltriness of such language, is the fact that it is impossible for the editor to set up a difference between "napery and linens for personal use," that can have the slightest bearing upon the question under discussion.

The editor is wrong in saying that we were pleased to discover that statements he had made were contradictory. We merely referred to a single instance in which "the editor contradicts himself." He neither denies nor attempts to explain it.

In the technical question of using "wool *in which* to generate germs of fermentation," our comment was based on a misapprehension; and the editor is right. He scores a hit.

Continuing his argument, the editor speaks of what was a "common belief" in former days when the plague was prevalent; and of a "nervous dread" of the importation of rags or wool from infected districts; and of "wool-sorters' disease;" of the "favors shown to linen by the priests of Isis;" of the "*feeling* with which flax was regarded in days of old;" *et hoc genus omne*; and quotes several equivocal passages of Scripture to eke out his arguments.

This is all well enough, so far as it goes, and may be taken for all it is worth. And it is the best the editor has to offer as an offset to the researches of *Count Rumford*, *Pettenkofer*, the opinions of *Drs. Bell, Bosworth, Duncan, and Shoemaker*, and the rest of the from twelve to twenty pages of "proofs" we gave him; and, if it were all, we should be willing to go to the jury without further comment. But that the editor has established a claim to further consideration, and *how* he has done it, will need to be shown before we can, in the interests of truth and justice, drop him out of the case.

Respecting textures or fibres as a vehicle of infection, the editor will, perhaps, be surprised to learn that he is in exact accord with Divine Wisdom in making no distinction between "rags and woollen," or "linen and woollen." "The garment also that the plague of leprosy is in, whether it be a woollen garment or a linen garment; whether it be in the warp or woof, of linen or of woollen."—Levit. 13 : 47, 48.

As to what we said about "speaking of wool and hair and fur, as the excretion of sluggish bodies," we have not the slightest qualification to make. Likewise, our editor stands his ground. He says, in reiterating his position, that :

"Wool is thrown off the body [as, for example, the hair, which is the glory of a woman, 'given her for a covering,' is thrown off her head!] and sheep are somewhat sluggish—stupid is the term usually applied to them, and they appear to deserve it. Their best qualities are to yield mutton and furnish wool, for neither of which good services, as we admit them to be, are the animals really responsible. 'Wool-witted' was a popular epithet in days gone by, as passages in the old dramatists might prove, if it would not be thought slanderous to produce them. The extract from *Apuleius*, to our mind, is a capital proof of how the feeling with which flax was regarded in days of old was not confined to the early Christians or entirely based upon the Bible. There are, as we all know, many verses in Holy Writ, of which we would write reverently, which put flax in the most exalted position, whether in figure or in actual use. This exaltation of linen doubtless led to the high esteem in which it was held by

the Fathers and their followers. It was constantly regarded by them as typical of purity and continency ; the incidence of its growth from the earth, when it was the only vegetable fibre used to any extent, reminded them of the resurrection ; its use for vestments, which has continued to this day, was partly founded on Levitical precedents, but had a stronger occasion in that, as St. Jerome said, ' the linen robe hath in it nothing which is of death, but is wholly bright and pure.' It will be found that James, known as the Just, who was appointed head of the church at Jerusalem after the apostles, was alone allowed ' to enter the Holy of Holies, seeing that he wore garments, not of wool,* but of linen.' These things, among others, justify and more than substantiate the expressions of Apuleius."

First, let us put side by side the Irish editor's words stigmatic of the sheep : " sluggish," " stupid," " wool-witted ;" and his statement that " there are many verses in Holy Writ, of which we would speak reverently," and then ask the reader to note the difference in the standing of this " stupid animal," (which is not " responsible" even for the good services it renders,) in the pages of Holy Writ, and that which it has in the columns of *The Irish Textile Journal*. Of all the creatures that ministered to the needs of man, it is, in the Bible, always first in rank and almost always first in name. Nearly a hundred times the sheep is mentioned in Holy Writ, and never once with the remotest suggestion that it was the ignoble, unclean, " sluggish," " stupid," unworthy creature that Apuleius and the Irish editor would make it out to be ; but, frequently, as one deserving and receiving the special care of Divine Providence. It was regarded as a symbol of meekness, patience, purity, and innocence, so emblematic of the spirit of the Son of Man, that in both the Old and the New Testament, the Saviour of the world is called the Lamb of God.

From the beginning to the end, the sheep was the companion of man, furnishing him with food and raiment. Abel was a keeper of sheep. And so was Rachel : " And while he yet spoke with them, Rachel came with her father's sheep, for she kept them." David was a shepherd, and " returned from Saul to feed his father's sheep at Bethlehem." And he was " taken by the Lord from following sheep to be a ruler over Israel." And he called his people his sheep, and imprecated the wrath of the Lord upon himself rather than that his innocent flock should suffer. " Mesha, the King of Moab,

* Words which indicate that everybody else wore wool.

was a sheepmaster, and rendered unto the King of Israel *a hundred thousand lambs, and a hundred thousand rams*, WITH THE WOOL.

Nor does it seem impious in the great king to liken the Lord God Omnipotent unto a shepherd :

“ He made his own people to go forth like sheep, and guided them in the wilderness like a flock. For he is our God ; and we are the people of his pasture, and the sheep of his hand.” “ Know ye that the Lord is God. . . . We are his people and the sheep of his pasture.” “ My people hath been lost sheep.” “ Israel is a scattered sheep.” “ For thus saith the Lord God : Behold, I, even I, will both search my sheep and seek them out.” “ The Lord thy God shall bless the flocks of thy sheep.” “ Blessed shall be . . . the flocks of thy sheep.” “ The house of Israel is my people—my flock, the flock of my pasture.” “ Give ear, O shepherd of Israel.” “ So we thy people and *sheep of thy pasture* will give thee thanks for ever.” “ Behold the Lord God will come. . . . He shall feed his flock like a shepherd. He shall gather the lambs with his arm, and *carry them in his bosom*, and shall gently lead them that are with young.”

“ As a shepherd seeketh out his flock in the day that he is among his sheep that are scattered ; so will I seek out my sheep and will deliver them out of all places where they have been scattered in the cloudy and dark day.” “ And ye my flock, the flock of my pasture, are men, and I am your God, saith the Lord God.”

“ What is man that thou art mindful of him ? and the son of man that thou visitest him ? For thou hast made him a little lower than the angels, and hast crowned him with glory and honour. Thou madest him to have dominion over the works of thy hands : thou hast put all things under his feet : all *sheep* and oxen, yea, and the beasts of the field ; the fowl of the air, and the fish of the sea, and whatsoever passeth through the paths of the seas.”

The sheep are named before all other creatures. And everywhere the proof abounds of the value set upon them, both on account of their flesh for food and their wool for clothing. “ Damascus was thy merchant, in the multitude of the wares of thy making, for the multitude of all riches ; in the wine of

Helbon and *white wool*." "Should not the shepherd feed the flocks?" "Ye eat the fat, and ye *clothe ye with the wool*." "But ye feed not the flock." "Thou hast given us like *sheep appointed for meat*." "If his loins have not pressed me, and if he were not warmed with the fleece of my sheep."

As an emblem of purity, the word wool is frequently used in the Bible. "He giveth snow like wool." "Though your sins be red like crimson, they shall be as wool." "I beheld till the thrones were cast down, and the Ancient of days did sit, whose garment was white as snow, and the hair of his head *like the pure wool*." "His head and his hairs were white like wool, as white as snow." "Forasmuch as ye know that ye were not redeemed with corruptible things, as silver and gold . . . but with the precious blood of Christ, as a *lamb without blemish, and without spot*." "And looking upon Jesus as he walked, he saith Behold the Lamb of God!" "Behold the Lamb of God, which taketh away the sins of the world." "The Lord is my shepherd, I shall not want." "The Lamb is Lord of lords and King of kings." "And they overcame him ['that old serpent, called the Devil'] by the *blood of the Lamb*, and the word of their testimony." "And I looked, and, lo, a *Lamb* stood on the Mount of Zion, and with him a hundred forty and four thousand, having his Father's name written in their foreheads." "These are they which are not defiled, . . . which follow the *Lamb*. . . . These were redeemed from among men, being the firstfruits unto God and to the *Lamb*."

"The Lord is my shepherd." And it was "the God of peace that brought again from the dead our Lord Jesus, *that great shepherd of the sheep*." And to Peter, he said, "Feed my *lambs*;" "Feed my *sheep*;" "Feed my *sheep*,"—repeating the injunction in the same breath. And it was he who said, "I am not sent but unto the lost *sheep* of the house of Israel." And it was he who sent "the twelve . . . to the lost *sheep* of the house of Israel." "For the *Lamb* which is in the midst of the throne shall feed them, and shall lead them unto living fountains of waters." "And I beheld, and I heard the voice of many angels sound about the throne, . . . and the number of them was ten thousand times ten thousand, and thousands of thousands: Saying with a loud

voice, *Worthy* is the *Lamb that was slain to receive power, and riches, and wisdom, and strength, and honor, and glory, and blessing.*" All these things are to "be unto him that sitteth upon the throne, and unto the *Lamb* for ever and ever."

And He, the Lord of lords, and King of kings: "*He shall set the SHEEP on his right hand, but the goats on the left.*"

There are many other passages similar to the foregoing. The saints, the disciples of Christ, the delivered and redeemed; they whose sins have been made white as wool in the blood of the Lamb, all the pure and holy ones, are symbolized in this one word *sheep*, the name of a creature held in so poor esteem by Apuleius and the Irish editor. Had our editor first done what he so patronizingly commended to us, we doubt whether we should ever have heard the commendation.

Scott's comment upon Exodus, 25 : 4 and 35 : 6, is partly as follows: "Wool, and linen, and goat's hair, or their materials for making clothes dyed of the color here mentioned, were highly valued." Smith (Illustrated Dictionary of the Bible) says:

"Sheep were an important part of the possessions of the ancient Hebrews and of Eastern nations generally. . . . Sheep and lambs formed an important article of food. The wool was used as clothing. . . . It is very striking to notice the immense number of sheep that were reared in Palestine in biblical times. . . . As the sheep is an emblem of meekness, patience, and submission, it is expressly mentioned as typifying these qualities in the person of our blessed Lord. The relation that exists between Christ, 'the chief Shepherd,' and his members, is beautifully compared to that which in the East is so strikingly exhibited by the shepherds to their flocks." He also says: "Wool was an article of the highest value among the Jews, *as the staple material for the manufacture of clothes.* The importance of wool is incidentally shown by the notice that Mesha's tribute was paid in a certain number of rams 'with the wool.' The wool of Damascus was highly prized in the mart of Tyre. The Israelites were forbidden to wear a garment mingled of woollen and linen. Among the laws against unnatural mixtures is found one to this effect: 'A garment of mixtures shall not come upon thee.' Levi. 19 : 19. The reason given by Josephus (Ant. iv. 8, section 11) for the law which prohibited the wearing [of] a garment woven of linen and woollen is, that such were worn by the priests alone."

The prohibition of the manufacture of mixed textures was aimed as much at linen as at woollen, probably more. It came under a general principle of condemnation of adulterations of every kind. The forbidding of the adulteration of woollen with linen, (or linen with woollen,) is put in the same

category with the command against "sowing the vineyards with divers seeds;" the "gendering of cattle with divers kinds;" and the "ploughing with an ox and an ass together." It is not unlikely that the idea of "all-wool" was as much of a recommendation of a textile fabric then as it is now. And, surely, nothing can be more acceptable to the true woollenite than the scientific interpretation of the injunction upon the priests, "that no wool shall come upon them *while they minister in the gates of the inner court, and within*;" including the command not to "gird themselves with anything that causeth sweat." This is in accordance with three of the most important properties of the woollen fabric;—properties which promote perspiration, favor its transmission to the outer surface of the fabric, and its discharge into the adjacent atmosphere. Regarding the "excrementitious" nature of the cutaneous exudations, it was manifestly better that these excretions should be temporarily suppressed and confined in the body, or stored up in the linen fabric, than that the "holy chambers" should be contaminated by their diffusion into the sacred atmosphere. As soon as the priestly ministrations were completed, the inner garment was put off, and the customary garment, presumably woollen, or, as Josephus tells us, a mixed one, resumed.

"And when they go forth into the outer court, even into the outer court to the people, they shall put off their garments wherein they ministered, and lay them in the holy chambers, and they shall put on other garments, and they shall not sanctify the people with their garments."

Now, in the more than fifty times in which "linen," and "fine linen," are mentioned in the Scriptures, they are not once spoken of as a material for underwear—as a garment to be worn next the skin, unless the "breeches" ordered for Aaron and his sons are to be regarded as such. "The drawers of the priests," as Smith calls them, (Dictionary of the Bible,) are nothing but the above-named breeches, more properly breech-cloth, since they were the prototype of the most abbreviated cut of the modern, male bathing-suit.

"And thou shalt make them linen breeches to cover their nakedness: *from the loins even unto the thighs they shall reach*."—And these "linen breeches shall be put upon his flesh."—Lev. 6 : 10.

This is the only mention of a linen garment to be worn next the skin, and then only during the holy ministrations. And the last above-given quotation may be regarded as confirmatory of the scientific interpretation put upon Eze. 44 : 18.

They made linen coats, bonnets, and girdles, "and a mitre," for Aaron and his sons. They used linen for "curtains," "hangings" for the tabernacle; the "veil of the temple;" coverings for beds, tapestry work, shrouds, sails, towels, napkins, measuring-lines; and sometimes clothes. Joseph, when made ruler of Egypt, was "arrayed in *vestures of fine linen*;" David was "clothed with a robe of fine linen," and "all the Levites that bare the ark;" "Mordecai went out from the presence of the king . . . with a garment of fine linen and purple;" "and the seven angels came out of the temple, having the seven plagues, clothed in pure and white linen."

There are two passages in Revelations, which, at first sight, it seems, ought to delight the heart of our editor and his coadjutors; though, upon reflection, it is easy to understand why they are willing to overlook them.

"And the armies *which were in heaven* followed him upon white horses, clothed in pure linen white and clean."

"And to her it was granted that she should be arrayed in fine linen, clean and white, *for the fine linen is the righteousness of saints.*"

It is quite apparent why the advocates of linen do not care to quote these passages to enforce their arguments in favor of linen for *skin diseases* and hygienic purposes.—Finally :

"And there was a certain rich man, which was clothed in purple and fine linen, and fared sumptuously every day."

But his fine linen did not "sanctify" him : "the righteousness of saints" was not in it; for, "in hell he lifted up his eyes, being in torments."

It may be well to notice here that the distinguished Prof. Pettenkofer, pronounces emphatically against the "fine linens" that are so high in favor with our Belfast advocates. He has recently added something to his deliverances on woollen fabrics, without greatly adding to his reputation for scientific acumen. He seems to be in the attitude of a very great man trying to get one leg on each side of a very high

fence. If anything he has heretofore said, has tended to give the "Leinwand-Industrie" "*einen sehr wesentlichen Rueckgang*," he will make amends by taking back as much of it as possible. He would be friends with the linen men. And so he gives a sort of linsey-woolsey opinion in favor of linen, in some half-dozen lines, and more than two columns of all-wool facts and arguments to contradict it. He thinks that, under certain conditions, linen *may* be *as* good as wool, *if* it be only coarse enough, free from starch, and otherwise reconstructed and properly adjusted to the skin.

He says :

"I am convinced that we can clothe ourselves as well and as healthfully in linen material as in woollen material, if we are careful to see that the clothing, as well as the immediate covering of the skin, is properly aerated, and that the immediate radiation of heat from the skin be not too great." *

If the Linen-Industry will get upon its legs again, it must recognize the necessity of revolutionizing its textures.

"If, in our linen material, we would use a coarser-meshed fabric, we could thereby ensure just as regular a reduction of temperature. Those persons who have hitherto always worn the coarser linen cloth, as our peasants, for example, have, by no means, such need of wool as those who wear fine shirts ; and the more recent Linen-Industry is proceeding in that direction, as it no longer produces any so compactly woven textures." †

In reply to our editor's remark that our ideas of damage to the Linen Trade, through the "agitation in favor of wool," "is very funny," we give the following lines from Pettenkofer :

"The Wool-régime has quite recently broken ground in magnificent style. There are, indeed, many persons who believe that they cannot live healthily without a woollen shirt ; and, therefore, the Wool-Industry is greatly pro-

* "Ich habe die Ueberzeugung, dass wir uns in Leinenstoffe ebenso wohl und ebenso gesund kleiden koennen, wie in Wollstoffe, wenn wir nur dafuer sorgen, dass die Kleidung, also die Hautbedeckung, immer gehoerig luftig bleibt und der Waermeabfluss unmittelbar von der Haut nicht ein zu grosser wird."

† "Wenn wir groessere und grobmaschigere Gewebe bei den Leinenstoffen anwenden, so koennen wir die Entwaermung dadurch geradeso regelmaessig besorgen. Die Leute, die bisher schon immer groebere Leinwand getragen haben, wie unsere Bauern zum Beispiel, die haben lange nicht das Wollbeduerfniss wie die Leute mit feinen Hemden, und die neuere Leinen-Industrie geht jetzt auch in dieser Beziehung vor, indem sie keine so enggeschlossenen Zeuge mehr herstellt."

moted, while the Linen-Industry has experienced, in this respect, a very essential back-set.”*

Even his own witnesses turn upon him. Here is what Senior-Surgeon Startin, of the “London Skin Hospital,” has to say on this point. “In point of fact, linen has been so pushed into the background by the persistent advertising of woollens and long-cloth for underwear, that *it is seldom asked for.*”

After devoting nearly two columns, as it appears in the *Staats Zeitung*, (New York,) to the merits of wool as a clothing material, in the course of which occur the words :

“The different materials differ in respect of the quantity of water which they absorb hygroscopically. *Wool material absorbs much more water than linen material ;*” (the italics are ours ;)

Prof. Pettenkofer says :

“Hitherto I have had more to say in favor of woollen than of linen. But linen also has merits peculiar to itself—good qualities which wool has not. Rubner has recently caused some investigations to be made to ascertain how much perspiration is absorbed from the skin by different clothing materials. The result shows that much more perspiration is taken away from the skin by vegetable-fibre fabrics, than by animal-fibre materials. It is well known that perspiration is most copious from the feet, and so the experiment was made, by several persons, of wearing a woollen sock upon one foot and a linen sock on the other, in the supposition that equal quantities of perspiration would be obtained from each. An exact determination was made, and it showed that whenever the socks were changed from one foot to the other, different quantities of perspiration appeared, more, indeed, always essentially more, on the foot where the linen sock was than on the other. The wool, of course, leaves the perspiration behind on the skin—that is, the perspiration does not pass off. It has been already observed that those who wear woollen, have to bathe more frequently than those who wear linen.”†

* “In neuester Zeit hat sich das Wollregime in grossartiger Weise Bahn gebrochen. Es giebt ja viele Personen, die glauben, ohne Wollhemd nicht mehr gesund leben zu koennen, und auch die Woll-Industrie hat sich dadurch sehr gehoben und die Leinwand-Industrie empfindet in dieser Richtung einen sehr wesentlichen Rueckgang.”

† “Bisher habe ich also mehr Vorzuege fuer die Wolle als fuer die Leinwand erwaeht. Aber die Leinwand hat doch auch etwas Spezifisches, was die Wolle nicht hat. Es hat Rubner in der neuesten Zeit untersuchen lassen, wie viel Schweiss von der Haut durch die verschiedenen Kleidungsstoffe absorbirt wird, und da hat sich ergeben, dass von den aus *Pflanzenfasern gewebten Zeugen viel mehr Schweiss von der Haut weggenommen wird, als von den thierischen Stoffen.* An den Fuessen schwitzt der Mensch bekanntlich am meisten und es wurden nun von verschiedenen Personen an einem Fuss Wollensocken, am

Had Prof. Pettenkofer borne in mind Count Rumford's experiments with wool and linen, he could hardly have used the language found in this paragraph. That he had forgotten them, or did not know of them, is evident from his statement that no scientific investigations with regard to clothing material were made prior to about twenty-five years ago: "Die wissenschaftlichen Untersuchungen ueber unsere Kleidungsstoffe haben erst vor fuenfundzwanzig Jahren begonnen."

The works of Count Rumford show that Prof. Pettenkofer is at least seventy-five years out of the way.—The only reply that need be made to the essential points in the long passage above quoted, is found partly in Prof. Pettenkofer himself, and partly in a few passages from Count Rumford's book published in 1792.

First, compare Prof. Pettenkofer's statement that "wool material absorbs much more [water] than linen material," with his other statement that "much more perspiration will be taken away from the skin by a vegetable-fibre fabric than by an animal-fibre material;" and then decide which of these two statements—obviously contradictory—is corroborated by the following passages from Count Rumford:

"Woollen clothes greatly promote insensible perspiration, owing to the strong attraction which subsists between wool and watery vapor which is continually issuing from the body."

"The perspiration of the human body being absorbed by a covering of flannel, it is immediately distributed through the whole thickness of the substance, and by that means exposed by a very large surface to be carried off by the atmosphere; and the loss of this watery vapor, which the flannel sustains on the one side, by evaporation, being immediately restored from the other, in consequence of the strong attraction between the flannel and this vapor, the pores of the skin are disencumbered, and they are continually surrounded by a dry, warm, and salubrious atmosphere."

"It is a mistaken notion that it is too warm a clothing for summer. I have

andern Leinensocken getragen, so dass man annehmen konnte, dass ganz gleiche Schweissmengen erzielt wuerden. Es wurde eine ganz exacte Bestimmung gemacht und es zeigte sich: je nachdem man die Socken wechselte, ergaben sich verschiedene Schweissmengen, und zwar fand sich immer dort, wo Leinensocken waren, mehr Schweiss, und zwar wesentlich mehr als auf dem anderen Fuss. Diesen Schweiss laesst uns natuerlich die Wolle auf der Haut zurueck, der geht da nicht mit. Man will auch schon gefunden haben, dass Derjenige, der Wollhemden traegt, mehr baden muss, als der Andere, der Leinwandhemden traegt."

worn it in the hottest climates, and in all seasons of the year, and never found the least inconvenience from it. It is the warm-bath of a perspiration confined by a linen shirt, wet with sweat, which renders the summer heats of the tropical climates so insupportable ; but flannel promotes perspiration and favors its evaporation ; and evaporation, as is well known, produces positive cold." *

If Rubner's tomfoolery with the feet, in which no account is taken of the perspiration *transmitted and evaporated* by the woollen sock, according to Count Rumford, is offered by Prof. Pettenkofer as a sample of "scientific research," which, he says, began for the first time twenty-five years ago, we shall be excused for preferring the conclusions based upon the more elaborate experiments of the illustrious scientist of the last century.

The reader will remember that our editor has something to say about "misrepresentations that are surprising." Sanctioning the harshest word he can apply to such a trick, we give the following passage from his article, on page 3d, *The Irish Textile Journal*, July 15th, 1891.

"Dr. Rutherford goes further, and maintains that it [wool] *is the one fibre* designed by Providence for the clothing of man--'Providentially designed for the clothing of an animal body.'"

Now, will it be "surprising" to our editor to be told, that, in so far as that passage relates to us, *there is not one word of truth in it?* And yet, he substantially repeats it :

"Why wool *alone* should be thought to have the approbation of Providence is hard to understand, unless it is that other animal substances—fur and feathers and skins, with non-vegetable silk—are not adapted to the requirements of the one and only System."

Three things are here especially to be noted : In the first place, "Dr. Rutherford" has never anywhere said or "maintained" that wool "*is the one fibre* designed by Providence for the clothing of man," or of an animal body. In the second place : The phrase "providentially designed for the clothing

* This expression, "produces positive cold," in the nomenclature of later science, would be *reduces the temperature* : as cold is merely privation of heat, or the conversion of sensible into insensible heat. The simple experiment of pouring a few drops of ether into the palm of the hand, will strikingly illustrate the cooling effect of evaporation. It is the peculiar relation of the fine woollen fabric to the processes of absorption and evaporation that makes the woollen garment auxiliary to the automatic action of the skin in regulating the animal temperature.

of an animal body," is not ours, but expressly ascribed by us to Count Rumford. Thirdly : That phrase is deliberately cut from its moorings (in the paragraph from which the editor quotes it) to the words, "wool, hair, and fur"—"as being providentially provided," etc.

The entire sentence, as it stands in the pamphlet, is here reproduced :

"When we consider the structure of the woollen fibre, its chemical composition, its wonderful physical properties, its repulsion to water, its affinity for vapor, its attraction for air, which outranks all substances as a non-conductor of heat and electricity, and the relation of all these facts and principles to the animal economy, it is no wonder that Count Rumford spoke of wool, and hair, and fur as being providentially designed for the clothing of an animal body."

Does that look like maintaining a "one-fibre" or a "wool-alone" theory? Or, is it an illustration of the editor's somewhat bumptious declaration : "When we fight, we fight fair"?

Is it fair to mutilate the record in order to make a point against an adversary? Or can the editor hope to find, as in the Dr. Shoemaker case, a scapegoat of a "correspondent" to bear away the reproach of this iniquity?

Our editor next draws an argument from *Laumbergii Horticultura*--an argument so frivolous and silly that the editor himself evidently turns in disgust from it. With regard to the remainder of this paragraph, we say, in all sincerity, that, if our editor will seriously consider it, he will be as much ashamed of it as of the other, and as little "inclined to press it." That he neutralizes the first half of his argument, to show that man's ingenuity is equal to the making of his own clothing, by Dr. Lahman's proof that he needs no clothing at all, never seems to enter his head. We will let Dr. Lahman dispose of himself and the editor at the same time, simply remarking that it is amazing into what predicaments writers will plunge themselves when they are so intent upon making one point that they are blind to all others.

"No doubt," says Dr. Lahman, (as quoted by our editor,) "the outer condition as well as the inner of all animals is fitted to their surroundings, and where they are clothed in wool--wool growing out of their skin--it is evidently for their good. On the other hand, where they are not so clothed, it may be taken for granted that they are better without it."

Construed strictly, the logic is this: The outer and inner condition of all animals, is fitted to their surroundings, the animal, man, included. Whenever an animal is clothed in wool, or anything else that grows out of its skin, it is evidently for its good. Whenever the outer and inner condition does not produce such a clothing from the skin, the animal is better without it. Now, since neither wool, nor feathers, nor hair, linen nor cotton, grows out of a man's skin, he "is evidently better off without it" or any of them. Are Dr. Lahman and the Irish editor willing to appear in public clothed upon this principle? Or does the Irish editor expect to make a market for Irish linen by teaching such a doctrine? Of course, neither of these gentlemen intends to go where their logic would lead him. I say *their*, it being Lahman's by origination, the editor's by adoption. We admit that our major proposition is not a very lucid one, since the identity of "outer conditions" and "surroundings" makes somewhat of a mess of it. But we had to deal with the rhetoric as it was provided to us.

The attempt to belittle the authorities we cited, is of a piece with most of our editor's article. The fling at the probity or intelligence of these well-known public men, as most of them are, is, besides being far below the level of honorable discussion, an unmistakable confession of the desperation of the editor's cause.

He thinks, however, that

"One extract from Count Rumford is *worthy of respect*, although that is founded on the fact that woollen clothes greatly promote insensible perspiration; which is no advantage from our point of view. In health, perspiration does not require to be promoted. But Count Rumford's opinion, as well as those of some other of these authorities which we are bid to consider, favors flannel. Now, Dr. Jaeger is emphatic in his condemnation of flannels, as he is of every material not manufactured by his concessionaries."

The question here is "Woollen or Linen;" but our editor seems to think he has found a mare's-nest in "flannel." That is what he would like to talk about. Well, what *is flannel*? Worcester defines flannel to be "a soft, nappy, woollen cloth."

Now, if Dr. Jaeger has ever uttered a word or written a line in condemnation of "a soft, nappy, *woollen* cloth," as such, it has never come to our knowledge.

About a hundred years ago Count Rumford demonstrated the superiority of woollen to linen as a material for under-clothing. We understand Dr. Jaeger as holding the same opinion. Unless the Irish editor can show that this is not the fact, any attempt of his to insinuate a disagreement between these men on this point, will not redound to his credit for candor or intelligence.

That the fine, soft, and elastic stockinet fabrics of recent production, are better than the coarse flannels of Count Rumford's day, or other woollen fabrics of the present day, we have good reason to believe when such an author as Dr. Duncan says: "When I use the word 'flannel' or 'woollen,' I would be always understood to urge *that best form of all*, Jaeger's sanitary clothing."

Will our editor permit us to ask him, if *that* is the kind of "flannel" that Dr. Jaeger condemns?

Now, there is a certain writer, who has figured somewhat conspicuously, of late, in the columns of *The Irish Textile Journal*, who writes:

"Dr. Rutherford says I have confounded Dr. Jaeger's System with the practice of wearing *thick woollen jerseys, drawers, socks, and heavy coats*. On the contrary, I *distinctly* separated them, and gave Dr. Jaeger credit for his idea of lightening clothes to the utmost." [And yet, he does not hesitate to call them "abominations."]*

* The word "woollen" seems to act upon the Doctor's mind somewhat as the word "tariff" used to affect the sensibilities of the eccentric John Randolph, who said he hated the very word tariff so that he would go a mile out of his way, any time, to kick a sheep. The Doctor has had his kick at the meek and unwitting offender. Wool is as much of an "abomination" to him as the Canaanite shepherd was to the ancient Egyptian, when the shepherd brought his flocks to the land of Goshen. The shepherds produced wool; the Egyptians manufactured fine linens. And they were no less concerned for a market for the product of their looms then, than Dr. Milton seems to be for the outputs of the Belfast mills.—We, by no means, would insinuate that the Doctor is a stockholder in the Belfast mills. We put his solicitude for the triumph of linen upon the high ground of a kind of ancient grudge, a "lodg'd hate, and a certain loathing," he bears to the "abominable contrivances" made of wool, and an honest conviction of the superiority of linen to wool as a dressing for the itch and kindred diseases. The Doctor *thinks* that linen is good for other purposes; but the *argument* and the *evidence* offered by him, Dr. Purdon, and Senior-Surgeon Startin, *bear solely* upon the point of its efficacy in relation to diseases of the skin or a predisposition to them. We say "thinks," because it does not appear that he has the knowledge of any personal experience with

These are the words of Senior-Surgeon Milton. And they seem to throw some light upon the insinuated antagonism of Count Rumford and Dr. Jaeger, in respect to flannels. And it also seems that Dr. Milton agrees with Dr. Jaeger in the condemnation of thick woollen jerseys, drawers, etc. And in agreeing with Dr. Jaeger, he convicts himself of an attempt to put Dr. Jaeger in a false position, in saying that we parade Count Rumford "as the greatest possible authority in favor of wool, and therefore of the Jaeger System, though *in reality* he [Rumford] *recommended flannel, ignored or expunged from their category by Dr. Jaeger and his supporters.*" Will these two gentlemen, the Editor and the Surgeon, now be able to see that Count Rumford could recommend *wool*, in preference to linen, in the form of *flannel*, and that Dr. Jaeger can recommend *wool*, in preference to linen, in the form of *stockinet*, without antagonizing each other? The only conclusion to be drawn from this part of the discussion is, that the woollen garment, in any form, is better than the linen in its best form.

Here is one more sample of our editor's methods :

"There is, besides, *nothing in any of these authorities* to indicate that they have given linen a trial at all, and consequently *we fail to see* where the question of woollen or linen is in the balance, that [sic] their experience or judgment can be *considered of any value whatever.*"

In view of the fact that several of the names we have given as "authorities," in our article, or pamphlet, are of men who have scientifically experimented with these materials, or have worn linen or cotton underclothing nearly all their lives, some of them till as late as about five years ago, when the Jaeger goods were first systematically introduced into this country; and that they are all men ranking high in their professions for intelligence and integrity,—in view of all this, what are we to think of such language as that last above quoted? The words that can fitly characterize it, had better be left unspoken.

the "abominable contrivances" as underwear. He has, to adopt his own phraseology, tried flannel, and condemns it, as, he says, Dr. Jaeger does. But he does not profess to have tried wool, and so, of course, can tell us only what he *thinks* about it. And, in the language of his friend the editor, his thought "is far from favorable to wool."

Now, we have something to say respecting the few paragraphs devoted to us by Senior-Surgeon J. L. Milton, in the same number of *The Irish Textile Journal*, July 15th, 1891.

There is nothing in his first paragraph requiring notice at our hands. With regard to the second, we turn him over to the tender mercies of his collaborator, Dr. Lahman, who thinks that the outer and inner conditions of animals agree, and that their proper clothing grows out of their skins; and that what does not grow out of their skins, they are better without. And, if Senior-Surgeon Milton thinks nature or Providence made a mistake in the case of the sheep, "an animal which looks distressed enough," we leave him to settle the point with Dr. Lahman.

In his 3rd paragraph, Senior-Surgeon Milton says :

"Dr. Purdon and I, we are told, infer that, because Irish linen is a good dressing for nettle-rash, everybody ought to wear linen shirts and drawers. I again leave Dr. Purdon his share of the reply; as for myself, I distinctly say that I never inferred anything of the kind."

And we as distinctly say that we never said he did. Our language is: "But for Dr. Purdon and Surgeon Milton to infer," etc. "For," here, has the force only of the conditional *if*. Furthermore, "no infinitive, in English, ever expresses an affirmation." And so it will be seen that Dr. Purdon and Senior-Surgeon Milton were not "told" what the latter says they were. This may seem to be a small matter, but, to Dr. Milton, it was large enough to hang a question of veracity upon; and that is no small matter to us. When once convicted of an intentional misstatement, we shall cease to address the public. It is due to Dr. Milton that we state here, that no intentional misrepresentation is imputed to him. Had some of his long experience with skin-disease been given to a study of the English language, he would understand the meaning of words better, and use them with more prudence and precision. If he, bearing this in mind, will go over that part of our article, which he makes the subject of his fourth paragraph, he will see that there is no occasion for his criticism, and, of course, none for any present comment upon it.

In his fifth paragraph, he quotes our words correctly, as they follow, down to *science* included :

“ ‘The one man in all the (sic) ages that (? who) contributed the most to experimental science’ was Count Rumford, whom he forthwith parades as the greatest authority in favor of wool, and therefore of the Jaeger System, though in reality he recommended flannel, ignored or expunged from their category by Dr. Jaeger and his supporters.”

Here is *some* proof of the correctness of our strictures on the Doctor’s English. In attempting to correct us, he makes four errors in a single line. His “sic” is not called for. He imputes it to us by putting it in curves, instead of brackets. He does the same with his co-ordinate “who,” which, he thinks, should be used for our *restrictive* “that”—which is his fourth error.

Had the Doctor suggested the insertion of a comma after the word “ages,” we would accept the emendation; though, without it, all ambiguity is prevented by the restrictive “that” and its closely following correlative “Count Rumford.”

The Doctor says that we parade Count Rumford “as the greatest possible authority in favor of wool, . . . though *in reality* he recommended flannel,” in which regard he is assumed to differ with Dr. Jaeger.

We do not know what Dr. Milton means by flannel; but, if he pretends not to know what Count Rumford means by wool and flannel, we advise him to read that author’s account of his experiments with wool and linen, or even our quotations from it, in the pamphlet. It will then be made level to his understanding that two men can both be fond of cheese, though one of them may have a rational aversion to Limburger. If the Doctor would like to hear from us further on this point, we refer him to our treatment of the editor’s duplicate of the Doctor’s argument. We have only to say respecting the ill-judged assault upon Count Rumford, that when the Doctor comes to consider it dispassionately, he will—not be proud of it.

In his sixth paragraph, Dr. Milton says :

“With regard to the multitude of diseases which [the] wearing [of] flannel will prevent, it will be time to talk of that when we are told what they are.”

“What they are” !—On one point, at least, we defer respectfully to the Doctor’s “fifteen years’ experience,” and forbear to say that “they are” skin diseases. And yet, for

the sake of information, we venture to ask the learned Doctor whether *any* skin disease (if there be any such) that proceeds from defective action of that complicated organ, might not be *favorably affected* by a woollen garment, which, as Dr. Bell puts it, "gently stimulates the skin"?

But for answer to the last above-given quotation, we refer Dr. Milton, first, to the 91st page of *The Irish Textile Journal*, in which his own article appears. (July 15th, 1891.) He will there find three paragraphs from the Paris "*Special Correspondent*," that will considerably astonish and instruct him. Among other things, he will find some passages very much like the following :

"At the request of the Editor of this Journal, I have been seeing one or two leading skin doctors on the subject of the pamphlet recently published by the Jaeger people in New York. I find that the general opinion is that people liable to skin diseases, and especially persons inclined to arthritis, psoriasis, and similar maladies, should rigorously avoid the use of wool, unless in the form of the lightest kind of merino, next the skin. In case of people affected with rheumatism and rheumatic complaints of any kind, wool next the skin appears to be always insisted upon. The saying of a great doctor is that rheumatism enters by the skin, and must be driven out by the skin, and the opinion is that the driving-out process is best effected by the production of the constant perspiration which is the result of wearing woollen apparel.

"One doctor to whom I spoke on the subject said that it would be suicidal on the part of a rheumatic patient to dispense with woollen underclothing next the skin. I then asked him what he should recommend in the case of a patient afflicted with a rheumatic complaint, and at the same time disposed to some affections of the skin. He said that in such a case, while prescribing woollen underclothing next the skin, he should recommend the use of the lightest and least irritating fabrics obtainable. 'There is no curing rheumatism,' he said, 'without wool. Do not, however, understand me to say,' he continued, 'that a man who may be in the habit of not wearing woollen underclothing next the skin is any more liable to be attacked by rheumatism than a man who is. My remarks only refer to people who are suffering from rheumatism, and who wish to be cured. For such it would be folly to discard woollen underclothing.'

"'A résumé of the conversations' had by the correspondent with different members of the faculty there, 'and especially with certain gentlemen connected with St. Louis Hospital,' is that people suffering from or liable to skin diseases should 'eschew the use of woollen underclothing,' 'but that in the case of people liable to rheumatic affections, or already suffering from such, nothing but woollen fabrics, though not necessarily of the kind recommended by the Jaegerites, is indispensable, and that in cases where both skin disease and rheumatism threaten, wool must still be worn, even at the risk of aggravating the skin disease.'"

The New England Medical Monthly, (Jan. 15th, 1888,) says :

"A *London* physician, who, for six months, tested Dr. Jaeger's plan of wearing nothing but wool, day or night, says the result has been a complete immunity from colds and a marked increase in working capacity."

Dr. Wm. F. Hutchinson, in "*The American Magazine*," among other things urged in favor of woollen clothing, says:

"My patients often say to me, 'Doctor, I cannot bear wool next my skin. It causes intolerable itching, and is uncomfortable.' 'Very well,' is the answer, 'but try it just for twenty-four hours longer; and if you are still restless, you may change.' Inside the given time the cutaneous nerves have become accustomed to the new-comer, and have welcomed him as a far better friend than the one set aside; and in a week, the most delicate patient would not change back again at all. Besides additional warmth, there is an electrical action aroused by friction of wool against human skin, that promotes capillary circulation; keeps skin functions going, and largely contributes to general health in the singular way which I have named, for the want of a better term, vitalizing power. For electricity is close kin to life; how near, no one can tell."

The editor of *The New England Medical Monthly*, (Jan., 1889,) says:

"After a careful trial in our family and among our patients, we find it [the Jaeger System] is the most comfortable, as well as the most healthful system of clothing ever devised, and we can give it our most cordial commendation."

After he has perused and duly pondered these passages, we beg the Doctor to turn his attention to the following lines quoted from the 7th paragraph of his article:

"Dr. Rutherford improves upon prevention, for he distinctly affirms that woollen cures many diseases. This being so, the names of these affections should at once be given to the world, as I believe that medical men are up to the present time entirely unacquainted with a single disease which can be effectually treated in this way." [He should have written, *by this means*.]

Here are two sentences; fine words,—too good, in the Doctor's judgment, to be lost. The second is the better in spite of its flaws. But fine as it is, without the first, it is utterly pointless. And so the first is necessary. But was it *so* necessary as to justify its implied fabrication? Hardly. And yet a fabrication is what it is, pure and simple. The R. C. Rutherford who wrote the article Dr. Milton is criticising, has never, anywhere, "distinctly" or indistinctly, directly or indirectly, *affirmed*, suggested, or insinuated, that "woollen cures many [or any] diseases."

It is exceedingly unpleasant to have to contradict Dr. Mil-

ton in this way ; for we cannot believe him guilty of deliberately misstating us. Nor shall we be able to understand how he could have been so misled, till he refers to some words of ours which he has hastily misconstrued ; for such an *affirmation* of ours, we know he can nowhere find.

The 8th, 9th, and 11th paragraphs of the Doctor's article, tend mainly to show that he is about as infelicitous in treating history as he is in handling science. His flights are the loftiest when he gives freest rein to his " fine imagination."

The first five or six lines of the 10th paragraph, are creditable both to the Doctor's candor and modesty ; though rather suggestive of a willingness to retire from the field even though it be at the smaller end of the horn.

There is, however, one sentence in the paragraph that deserves particular notice. He says :

" True it [linen] does not promote sweating, which so many persons think necessary for the preservation of health, though almost invariably useless or mischievous."

Parallel with this we put two other passages—one from Dr. Milton himself, and the other from Prof. Pettenkofer.

Dr. Milton says that the sweat ducts " have to throw off daily something like two pounds of *excrementitious fluid almost as poisonous as air tainted by breathing.*"

Prof. Pettenkofer says : " Of the whole amount of heat which, under average conditions, we emit by radiation, convection, and evaporation, more than eighty-two per cent is thrown off by the skin, and only eight per cent, or a tenth part as much, by respiration."

For a professional man to say, that the promotion of perspiration (that function of the skin by which the *animal temperature is mainly regulated*, and *two pounds of poisonous matter daily eliminated from the body*) is " almost invariably useless or mischievous," is unwittingly to furnish his readers with a standard by which to estimate the value of *his opinion* on the question at issue.—We have somewhat more to say on this point further on.

The Doctor says : " At one time I believed in flannel, and that a conviction of its pernicious action was forced upon me by experience."

The Doctor does not tell us that he *wore* flannel himself, or

that it was the *Jaeger flannels* that forced his adverse conviction upon him. In fact, he should have added: *but this implies no objection to the "sanatory woollens" produced under the Jaeger System*;—which, though they "*gently stimulate*," do not irritate, overheat, or overtask the skin. This, for the sake of his own consistency, as well as in justice to "Dr. Jaeger and his supporters," he should have said; for, he has "distinctly separated" the "practice of wearing thick woollen jerseys, drawers, socks, and heavy coats," from Dr. Jaeger's System. Though he fell into this concession while hastening to repel what he erroneously assumed to be a false charge, it undoubtedly comes closer to the fact than it would have come had the learned Doctor clearly seen the full import of his words. When the Doctor will tell us that he has worn a Jaeger "flannel shirt," "quality K," and found its irritation intolerable, "we shall know what to think"—of his predisposition to disease of the skin.

It must be gratifying to the woollenites interested in the progress of this flurry over the linen question, to be informed, (*The Irish Textile Journal*, June 15th, 1891,) that those recent articles in that Journal, embody the most "important collection of professional evidence upon the properties of linen [that] has ever been issued,"—or probably ever will be. In the same number, Dr. Milton has another paper. Of this paper, the Irish editor, continuing the passage just above quoted, says:

"And the case in its [linens'] favor is *completed by the valuable communication* from Mr. Milton which we are enabled to offer in our present number."

From this "valuable communication" of more than two full columns, we extract the substance of the *argument* against woollen.

"To keep the skin in a superheated state by the use of *thick* woollen clothing, is as great an error as to systematically overload the stomach or try the eyesight."

"To *systematically* overload the stomach," and "to *systematically* try the eyesight," are expressions that we will not stop to criticise, since, in spite of the Doctor's language, we can make a fair guess at his meaning,—say *habitually* for "systematically."

In asserting the superiority of linen to woollen in skin diseases, he speaks of "how impossible it is to treat such diseases properly when the part [affected] is *systematically* heated and irritated by the use of *woollen*, cotton, or silk garments." His conviction on this point results from "*the* experience of thousands of cases." We presume he means *his* experience with thousands of cases.

"Also I mentioned that a *linen shirt is the healthiest* thing to wear, winter and summer."

Then there are six lines in which the objection to his view is stated, and his reply given, that "the objection is utterly unfounded, and the underlying line of thought a *piece* of superstition."

Then follows a paragraph of some twelve lines of assertions, the merits of which, as arguments, may be inferred from the crowning one, which runs thus :

"In fact colds are caught *purely from overheating*, a thing almost unheard of among those who keep to linen."

In one place the evil is "woollen or flannel ;" in another it is "woollen" that "makes the skin like a hothouse plant." But from the next eight lines we learn that it is neither woollen nor flannel that is the matrix of all the mischief, but the evil is "almost entirely due to the mistaken practice of *heaping up so much woollen and flannel* on the overtaxed skin, which would soon be *braced up* by the linen shirt."

Then, as another strong point against woollens, we are told that people "know that to keep a horse or a dog *too* warmly wrapped up ruins its powers of endurance, its capacity to resist cold ; yet they try to do to themselves what they would not do to a domestic animal." [That is, they try to keep themselves too warmly wrapped up.]

Next, we hear of "those who have been accustomed all their lives to a *heap of wool* on their skins ;" and then of the "heat and irritation of the skin which *woollen AND flannel* always set up"—that is to say, when they are put on in "heaps"—when *woollen AND flannel* are heaped up "on the overtaxed skin ;" not only that, but "*woollen AND flannel* sodden night and day with sweat."

He then hurls his lance at "the idea that perspiration is

wholesome ;” and “ distinctly” affirms that “ in a healthy person there should be *little or none.*”

Why, is it possible that the Doctor has gone clean daft ? Writers should have good memories ! It is only a minute ago that Surgeon Milton was discoursing eloquently about an “ enormous system” of “ sweat ducts,” “ designed to carry off the perspiration ;” a system supplemented by “ a multitude of ducts” discharging “ a suety kind of fluid ;”—all of which “ should be kept in order, but especially the *sweat ducts*, which *have* to throw off *daily* something like *two pounds* of *excrementitious* fluid, almost as *poisonous* as air tainted with breathing ; a function which, when interfered with by disease of the skin, occupation, etc., *must be carried on* vicariously and *imperfectly* by other organs, or *mischief will result.*” [Here is another sentence in which the Doctor says one thing when he means another. He says the function must be carried on *imperfectly* to prevent mischief ; but does he not mean that whenever the function is carried on vicariously, it is imperfectly performed, with a tendency to mischief proportional to the imperfection of the performance ?—In all the above quotations, the italics are ours.]

And this is science !—Senior-Surgeon Milton’s science ! And this is argument ! This undenied and undeniably just reprobation of the practice of keeping the skin “ in a superheated state by the use of thick woollen clothing ;” making “ the skin like a hothouse plant ;” “ heaping up so much *woollen AND flannel* on the overtaxed skin ;” keeping “ a horse or a dog *too* warmly wrapped up ;” wearing “ a heap of wool ” on one’s skin all one’s life long ; or “ *woollen AND flannel* sodden night and day with sweat ;” a fabric made of fibres with scales, and “ points and edges which so greatly irritate the skin ;” *—yes, all this is (and this is all of) Dr. Milton’s

* We have another instance of Dr. Milton’s scientific proficiency, in his description of the wool-fibre. He says that it essentially differs from cotton and flax, being of a scaly appearance and of irregular shape, presenting an innumerable number of “ *points and edges*, wh ch so greatly irritate the skin and make it hyper-sensitive.” He adds that “ It is serrated in a much more remarkable manner than cotton.”

The fact is that neither the cotton nor the woollen fibre is “ serrated ” at all. The woollen fibre is cylindrical, having neither “ points nor edges.” We know

argument to persuade the Belfast people in particular, and mankind in general, to substitute his skin-bracing "linen shirt" for the soft, elastic, light, and delightful woollen underwear, which is never fairly tried and afterward rejected. This is the sum and substance, pith, marrow, and backbone of the "valuable communication" which, according to the Irish editor, *completes the case in favor of linen*. It seems never once to have occurred to the editor, or to the Surgeon, that Dr. Milton and every prominent physician and every other sensible person in Christendom, are in perfect accord on all the points made by the former against the practice of clothing as denounced by him. There is, undoubtedly, one point on which some of them would take issue with Dr. Milton; and that is, that "the languor, irritability, loss of natural healthy appetite, cough, indigestion, headache," (and why not all the ills that flesh and skin are heir to?) can be purged out of

that the word serrated is used in treatises on wool; but "dentated" is better, though neither is accurately descriptive of the so-called "scales;" as may be seen by reference to the microscopic view (No. 1, page 431) of woollen fibres taken from a genuine, all-wool, stockinet fabric of the *Benger*, Stuttgart Mills. To be serrated, the woollen fibre should be flat like a saw-blade, and have an edge similar to the tooth-edge of the saw, or to a serrated leaf. Nothing could be more unscientific than to call the fine lines or ridges formed by the edges of the "imbricated scales," serratures or saw-teeth-shaped, especially in the finer wools where they are nearly or quite annular. And, as to these "points and edges" pricking or "irritating the skin,"—one can judge of that when told that the fine fibres of which the best woollens are made, measure about one-thousandth of an inch in diameter, (2.127 centimeters equal $\frac{1}{1194}$ of an inch,) and that the thickness at the edge of the "scale" is not more than one-hundredth part of that diameter—or about one-hundred-thousandth of an inch. Now, one can imagine how much a fibre of one-thousandth of an inch in diameter, with all the way from 1,800 to 4,000 scales, (1-100,000 of an inch thick,) to the inch, pressed against the surface of the skin, with the scales parallel to that surface, would be likely to *irritate* it. A polished marble surface could not feel smoother. Such a surface could not even "gently stimulate," to say nothing of *irritating* the skin. It is probable that the stimulation and the irritation, of even the *coarsest* woollen fabrics, are to be explained by reference to other qualities of the fabric than the fibre-scales. A suggestion of the real cause may be found in the following words of Pettenkofer: "Furthermore, it makes a material difference whether the fabric is in uniform, superficial contact with our skin, or only partially in contact with it—that is, by points, *punktweise*."—May not these points and the ends of the fibres be the cause of all the stimulation from which we profit, and of the irritation from which we, in the coarser flannels, suffer?

suffering humanity by the "bracing-up" properties of a linen shirt.

Finally, we thank the Doctor for his correction of our "misapprehension," though we think he will admit that that same faulty mode of expression which so misled Dr. Purdon, is chiefly responsible for our misapprehension.

We took up this case in our "SANITARIAN" article, republished in the pamphlet, as it was made up for us by the Irish editor and Senior-Surgeon Milton, in the 15th of February No. of *The Irish Textile Journal*. To the issue there made, our "authorities" and comments were addressed. And we now, after going carefully over the whole ground, insist that there is not, in that pamphlet, a line or a word unwarranted, or in the least degree misrepresentative or unjust.

ANOTHER RICHMOND IN THE FIELD.

Now, to put a cap-sheaf to this shock of "valuable communications," and *more than complete the case in favor of linen*, *The Irish Textile Journal* offers a contribution from *Senior-Surgeon Startin*, of the London Skin Hospital. He comes to express his sympathies with the "Irish manufacturers" in, that, "In point of fact linen has been so pushed into the background by the persistent advertising of woollens and longcloth for underwear." And this, though he does not hesitate to say that they—the manufacturers themselves—are "to blame for having allowed this *splendid* fabric of theirs to be thus treated." He is not, however, without hope. Nay, he is quite certain "that, if the matter is clearly and steadfastly put forward, trade success will follow." And so he makes a "humble effort" "to advance the industry, and mould public opinion" to "help on the cause," in the success of which he will "indeed feel very much gratified."

As a contribution to science and to literature, this "humble effort" of Senior-Surgeon Startin's, is a twofold curiosity. We would like to present it bodily to the reader; but must content ourselves with a summary—or sort of rosary of extracts, which may be called *the beauties of Startin*.

"The Queen, during the whole of her long and valuable reign, has long been a patroness, and has fully appreciated the great value, of Irish linen. Her

Majesty constantly sends large quantities of cast-off Irish linen to one or other of our large hospitals, well knowing the value and comfort it is to the poor suffering patients in the dressing of their wounds, and as a soft covering to their sore and weary bodies in bed."

This is worth reading over twice. "The Queen, *during the whole of her long and valuable reign, has long been a patroness . . . of Irish linen.*" She has not only *fully appreciated* the value, but *fully appreciated* the *great* value of Irish linen. And that *value* must be very great to, not only permit the *value* of her *reign* and the *value* of Irish linen to appear in the same sentence, but to make the Queen the *patroness* of Irish linen! "Her Majesty constantly sends large quantities of cast-off Irish linen to one or other of our hospitals, well knowing the *value* . . . it is as a soft covering," etc.

Further:

"*Linen* fabrics have *several advantages* over cotton and woollen fabrics." One of these *advantages* is, that it does not "*retain* moisture so *freely* as the more spongy cotton;" and, besides, its "*unequalled* purity, gloss, and smoothness . . . *makes* it alone the material suitable for shirt fronts, collars, wristbands," etc.

We have just been told that linen has *several* advantages over cotton; and now it turns out that "Cotton, on the other hand, has *many advantages of its own*"—over linen, of course. In which case, if *many* means more than *several*, cotton comes out ahead. Still, it is not easy to see how, of two dogs in a fight, both can have the advantage at the same time. There is ground for suspicion that the Senior-Surgeon either does not know what he is talking about; or that, knowing, he does not know how to say it.

He next informs us that,

"There is a *common* and very *popular* error, that of putting too many clothes on our bodies. It is a fact that clothing in itself has no *property of bestowing* heat, but is *chiefly useful* in preventing the *dispersion of the temperature of the body*, and in some instances in *defending* it from the *atmosphere.*"

We understand, neither how the *temperature* of any body can be dispersed, nor in what emergency the body need be *defended* from the *atmosphere*.

We give the following dozen lines entire, because, in spite of some error of fact and much bad grammar, they contain

truth enough to end the case forever for linen as an article of clothing *next the skin*.

“This power of preserving heat is due to the same principle, whatever form the clothing may assume, whether the natural covering of birds or animals, or the most beautiful and elegant tissues of human manufacture. In every case it is the power which coverings possess of detaining in their meshes atmospheric air; that is the cause of their warmth. All clothing should be such as shall permit free transpiration from the skin, and, moreover, convey the fluids from the surface; otherwise colds, irritation of the skin, and other bad consequences follow. There is scarcely any organ of the body that may not be affected by undue or irregular action, excited in some portion of the surface circulation of the skin. How necessary, therefore, for health's sake, as well as our skin, we should be most careful what we put on. I may now venture to say there is no material that answers so well in all its requirements as fine linen.”

The one passage, in the above quotation, fatal to his whole case, is in these words:

“All clothing should be such as shall permit *free transpiration from the skin*, and, moreover, convey the fluids *from the surface*.”

Now, if “free transpiration” means anything here, it means free “emission in the form of vapor” *from the skin*; “or through the pores.” That is, the clothing should be such as to obtrude no obstacle to insensible perspiration. But the Surgeon speaks of “fluids,” and so suggests a possibility that he may mean *transmission by the clothing*, through its meshes, of the fluids from the surface of the skin. We can see how, in this way, the clothing may convey the fluids from the surface of the body; but how it is to *convey* the fluids from its own surface, is not so clear. But then, again, there are no “fluids” to be conveyed from the surface of the body, for *transpiration* is “emission in the form of vapor;” and vapor is not a fluid susceptible of *evaporation*, the only process by which a “fluid”—as, for instance, *sensible* perspiration—can be *conveyed* from the surface of the clothing, as contemplated by Senior-Surgeon Startin, if we understand him. But, possibly, the Surgeon means the “surface” of the body—“and convey the fluids *from the surface of the body*.” But if *that* is what he means, what are we to do with the phrase “transpiration *from the skin*”? Transpiration *through* the skin is one thing; *transpiration from the skin* indicates the skin as the point of departure, and the clothing as the medium of the

transpiration ; and, so, we have the clothing both permitting the *transpiration* of the fluids from the surface of the skin, and *conveying* them from the surface of the skin.—This interpretation smacks so strong of nonsense, that the Surgeon will, of course, indignantly repudiate it.

Then, assuming that the Surgeon really meant to state the actual facts of the case, suppose we put it thus : “ All clothing should be such as to permit a free transpiration [through the skin] and favor the transmission of the vapor thus exhaled, to the outer surface of the fabric, whence it may be dispersed into the surrounding air.” Or, more concisely : All clothing should be such as to favor perspiration, and facilitate its transmission to the outer atmosphere.

Now, what clothing material is the best adapted to this purpose? It seems that there can be but one answer. But the Surgeon says :

“ I may now venture to say that there is no material that answers so well in all its requirements as fine linen.”

The second preceding sentence, in the Belfast pamphlet, is, in substance, that, for hygienic reasons, “ we should be most careful what we put on.” Then—as next above.

Can anybody tell what that means? Can any one guess what the “ material ” is to answer? Do “ material ” and “ fine linen ” stand for the same thing? If so, can any one conjecture what “ its requirements ” are? Or what the requirements of fine linen have to do with the requirements of the skin, or the animal economy, or anything above the earth or beneath it? In a word, is not this utterly inexplicable and inexcusable nonsense? It is better for Senior-Surgeon Startin that it should be so decided, and that the decision should never be reversed. For, if it is ever to be explained, as expressing the Surgeon’s opinion, that fine linen possesses those qualities which adapt it to the requirements of a suitable clothing for the human skin, it will, not only convict him of the grossest self-contradiction, but put him in flagrant opposition to the almost unanimous authorities of the scientific world. This is a harsh indictment. Our proof, with respect to the authorities, has already been presented. The proof with respect to the self-contradiction, is found in his own

lines. He tells us (page 22 of the pamphlet) that clothing "is chiefly useful in preventing the dispersion of the temperature [heat] of the body." This property of clothing is due to "the power which coverings possess of detaining in their meshes atmospheric air." Of this "power," fine linen is well known to be, if not entirely destitute, possessed in a degree greatly inferior to that of any other textile fabric. Starched and "glossed," fine linen contains or "detains" no air in its meshes. Unstarched fine linen, none that is not speedily expelled by water or moisture. The *icy chilliness* of damp linen is a fact familiar to everybody. If to assert that clothing is chiefly useful through its power to detain air in its meshes; and then to assert that the best clothing is made of a fabric that has little or no power to detain air in its meshes, is not a *contradiction*, we do not understand the word.

Another contradiction is found in his two declarations,—one to the effect that *all clothing should freely absorb and transmit the perspiration* to its outer surface; (p. 23;) and the other that *linen does not absorb moisture so freely even as the more spongy cotton*. (P. 22.) Nay, it is this very "fine linen," in all its "unequalled purity, gloss, and smoothness," upon which Pettenkofer has most emphatically set his seal of condemnation. (And that, too, chiefly because, as he says, "More sweat is conveyed from the skin by vegetable-fibre textures than by animal-fibre textures"—a statement that contradicts, not only Senior-Surgeon Startin, but Prof. Pettenkofer himself. "Wollstoffe absorbiren viel mehr [Wasser] als Leinenstoffe und Baumwolle.") And all the "great dermatologists of the day," or of any other day, have nothing to offer to the contrary. Observe this,—that "there is no material that answers so well in all its requirements as fine linen,"—and that, "This, all the great dermatologists of the day—Erasmus Wilson, Fox, Hebra, Durhing, the elder Startin—and I, myself, for many years have endeavored to teach and urgently recommended my patients to use, in spite of the recent *wave of opposition in favor of the much-vaunted woollen underclothing of the present day.*"

"Which of us dermatologists," the Surgeon asks, a little further down, "have [has] not *seen* the misery that flannel or wool has caused *to the excoriating eczema, the irritating urti-*

caria or nettle rash, the exasperating *prurigo*, and many other skin affections."

Senior-Surgeon Startin must have had a stubborn lot of patients, if, with all the great dermatologists, and himself to boot, recommending them to use it, (linen,) they still refused to do so, as they seemed to do, at least for "*many years*," "in spite of the *recent wave*," etc.

These great dermatologists do not seem to recognize any considerable difference between a plaster for a blotched skin and a full set of woollen undergarments. It is always skin disease, eczema, nettle-rash, *prurigo*; linen and skin disease; skin disease and linen!—"Years of experience . . . in skin diseases, *drawn* from the personal inspection of some thousands of cases," enables Surgeon Startin "to confirm what Dr. Purdon has already told us—how invaluable *he has found* linen to be in all skin affections."—And yet, "the good old custom of wearing linen next the skin has lost *some of its golden reputation*."

Why? Perhaps it is because, *partly* because, there are a good many men and women, and some children, who have more common-sense than salt-rheum, scald-head, or nettle-rash. But, let the *Surgeon* tell us! It is because "*These waves* [alluding to the wave of *opposition in favor of*] of fashion, *induced* by a tremendous amount of *advertising*, no doubt do *rule the public* mind to a great extent, no matter what the *material* may be, or how suitable it may be to wear."

That is "English as she is writ"—by the Senior-Surgeon of the London Skin Hospital. And here is some more of the same sort:

"But there can be no manner of doubt that the *hygienic properties* of linen will always carry *their* [the properties, observe] own *value* to those who have a healthy mind [and a pruriginous skin?] and who are willing to *listen* to the reasons which can be advanced for *its* adoption. *It is* beautiful to look upon and a real comfort *to use*, and *it* certainly *is* the best *material* to wear next the skin, especially when *it* is tender, sensitive, or afflicted with any *irritable affection* or irruption."

To get the full force of this passage as an argument, or "wave of opposition in favor of" linen underwear, we must read according to the construction. Thus:

"But there can be no manner of doubt that the *hygienic*

properties of linen will always carry *their* own value to those who have a healthy mind, and who are willing to listen to the reasons which can be advanced for *its* adoption. [i.e., the adoption of these properties.] It [the properties] is [are] beautiful to look upon and [the properties are] a real comfort to use; and *it* [the properties] is [are] certainly the best *material* to wear next the skin, especially when it [the properties or material] is tender, sensitive, or afflicted with an *irritable affection* or *irruption*."

We have heard of irritable persons, tempers, nerves, tissues, and the like; and of *irritating* affections of the skin; but never before of "*irritable affections*."

Another argument in favor of linen underclothing, is couched in the following exquisite phraseology:

"Which of us dermatologists *have* not seen the misery that flannel or wool has caused *to the excoriating eczema*, the *irritating urticaria* or nettle rash," etc.

Now, if it be possible for wool to "cause misery to" any of these diseases of the skin, we say, Blessed be wool! But, unhappily, that is not the case, as the Surgeon undoubtedly meant to say that the wool carries misery to the patient by aggravating the excoriating eczema, etc.

Seeing, as we do, from the foregoing extracts, how hazily the Surgeon discriminates the meanings of terms, we are not surprised that he should call the ever-increasing belief in the "*superior excellence* of woollen garments for underclothing," "a craze." Nor are we at a loss to account for his ignorance of the cause of this belief, or *craze*, though we admire the simple candor of his confession of it. We most devoutly believe him when he says "I know not;" "I cannot tell." It is in the light of these confessions, together with the *internal evidence*, that we are to estimate the Senior-Surgeon's opinion, that *the proper place for a woollen garment is over a linen one*.

We join the disinterested Surgeon in the hope "that the opening up [opening-up] of the great industry which centres in Belfast [,] will largely benefit the Irish people, and prove a great source of wealth to them,"—*provided* that the products of their looms be used for sails, sacks, table-cloths, handkerchiefs, clouts, and dressings for skin diseases.

There is a considerable measure of error in the Surgeon's position that "it is the power which coverings possess of detaining in their meshes atmospheric air, that is the cause of their warmth."—The fact is, that air is only one of the factors concerned in preserving animal heat, and, so, in maintaining the warmth of the body. Wool itself is a non-conductor of heat and electricity,—different names, or modes, of the same principle,—taking rank next to silk as a resisting medium. Besides, it has, together with fur, hair, and feathers, the property of attracting and retaining air in its meshes, in a higher degree than any other clothing material. And since air is, *of all substances*, the best non-conductor of heat and electricity, it tends more than any other medium to prevent the radiation of heat from the animal body. Yet, its non-conductivity would be of little avail if the thousands upon thousands of minute woollen fibres, constituting the web of a single garment, were not themselves also good non-conductors. The wisdom manifest in this association of qualities, may well be called divine. And it seems strange enough that it should be overlooked, or ignored, by our zealous friends of the "linen manufacturers."

We quote a few lines, bearing upon this point, from a writer removed by the space of a hundred years, from the suspicion of any solicitude for the "commercial success" of the woollen trade.

"But there is another circumstance which it is necessary to take into the account, and that is the attraction which subsists between the air and the bodies above mentioned, and other like substances constituting natural and artificial clothing." (Fur, eider-down, raw silk, etc.) . . . "That an attraction, and that a very strong one, subsists between the particles of air and the fine hair, or furs of beasts, the feathers of birds, wool, etc., appears by the obstinacy with which these substances retain the air which adheres to them, even when immersed in water, and put under the receiver of an air-pump; and that this attraction is essential to the warmth of these bodies, is very easy to be demonstrated.

"In furs, for instance, the attraction between the particles of air and the fine hair in which it is concealed being greater than the increased elasticity or repulsion of those particles with regard to each other, arising from the Heat communicated to them by the animal body, the air in the fur, though heated, is not easily displaced; and this coat of confined air is the real barrier which defends the animal body from the external cold. This air cannot carry off the Heat of the animal, because it is itself confined, by its attraction to the hair

or fur ; and it transmits it with greater difficulty if it transmits it at all, as has been abundantly shown by the foregoing experiments.

“ Hence it appears why those furs which are the finest, longest, and thickest, are likewise the warmest ; and how the furs of the beaver, of the otter, and other like quadrupeds which live much in water, and the feathers of water-fowls, are able to confine the Heat of those animals in winter, notwithstanding the extreme coldness and great conducting power of the water in which they swim. The attraction between these substances and the air which occupies their interstices is so great that the air is not dislodged even by the contact of the water, but, remaining in its place, it defends the body of the animal at the same time from being wet, and from being robbed of its Heat by the surrounding cold fluid ; and it is possible that the pressure of the fluid upon the covering of the air confined in the interstices of the fur, or feathers, may at the same time increase its warmth, or non-conducting power, in such a manner that the animal may not, in fact, lose more Heat when in water than when in air ; for we have seen by the foregoing experiments, that, under certain circumstances, the warmth of the covering is increased by bringing its component parts nearer together, or by increasing its density even at the expense of its thickness. But this point will be further investigated hereafter.

“ Bears, wolves, foxes, hares, and other like quadrupeds, inhabitants of cold countries, which do not often take the water, have their fur much thicker upon their backs than upon their bellies. The heated air occupying the interstices of the hairs of the animal, tending naturally to rise upward, in consequence of its increased elasticity, would escape with much greater ease from the backs of the quadrupeds than from their bellies, had not Providence wisely guarded against this evil by increasing the obstructions of those parts which entangle it and confine it to the body of the animal. And this, I think, amounts almost to a proof of the principles assumed relative to the manner in which Heat is carried off by air, and the causes of the non-conducting power of air, or its apparent warmth, when, being combined with other bodies, it acts as a covering for confining Heat.”

Thus we see that, while wool, by virtue of other properties essential to its office as an animal clothing, is not, in itself, a perfect non-conductor, it is so constituted that it powerfully attracts to itself, and makes subservient to the animal economy, the most powerful of all non-conductors.

In the light of these facts, and in that of his own statement, as quoted above, it seems incredible that Senior-Surgeon Startin should give the preference to any material as a clothing for the human body, as against the fine, soft, elastic, non-irritating woollen fabrics of modern construction. Of course we are not considering the case of persons who, by reason of some abnormality or idiosyncrasy, cannot bear woollen any better than others can abide a gaping pig or a harmless necessary cat ; or the unfortunate victims of skin diseases with whom our Senior-Surgeons have had their chief experience.

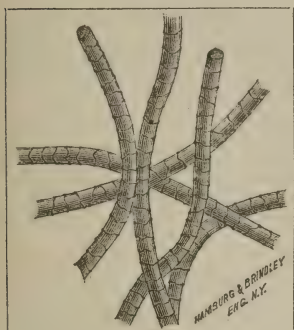


FIG. 1.—A microscopic view of *woollen* fibres taken from a Jaeger garment.

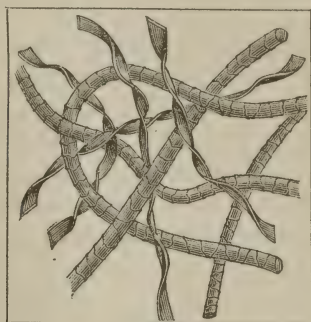


FIG. 3.—A microscopic view of woollen and cotton fibres mixed, taken from an imitation "all - wool" garment. The true relative size of the cotton fibre is seen in Fig. 2.

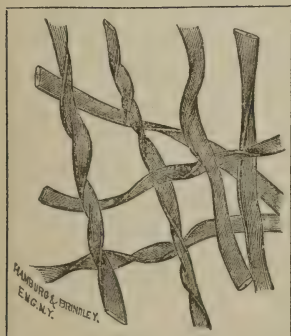


FIG. 2.—A microscopic view of *cotton* fibres.

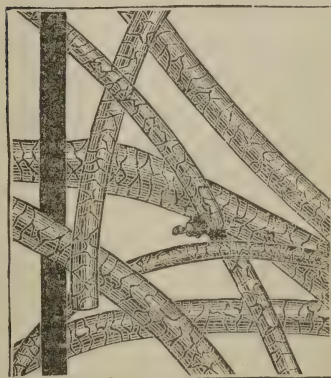


FIG. 4.—A microscopic view of fibres taken from an imitation fabric of inferior quality, showing seven grades of wool and a filament of some foreign substance.

A WORD FOR DR. PURDON.

In one place we are told of the "gloss and smoothness" which makes linen "alone the material suitable for shirt fronts, collars, wristbands," etc.

In another place, that clothing "is chiefly useful in preventing the dispersion of the temperature [heat] of the body."

In another, that this power of preserving heat is "in every case . . . the power which coverings possess of detaining [retaining] in their meshes atmospheric air."

The completeness with which the first of these passages is contradicted by the other two, is unmistakable. That the smooth, glossy, compact fine linen of shirt fronts, etc., possesses the power of retaining atmospheric air in its meshes, as the fluffy, porous, woollen fabric does, is not for an instant conceivable; and it is on this very fact that Pettenkofer bases his principal objection to it. But for his ignorance of these facts, Dr. Purdon would never have penned the following lines, as faulty in grammar as they are in fact :

"One means of securing good health is by wearing next the skin *Irish linen*, a material that does not clog the pores, and at the same time ALLOWS OF ADEQUATE VENTILATION."—The italics are his; the capitals are ours.

These lines from Dr. Purdon, as well as the article by Senior-Surgeon Startin, are found in the pamphlet reprint of articles from *The Irish Textile Journal*, avowedly published in the interests of the Belfast Linen Manufacturers.

The smell of the hospital is over it all. If there be any one capable of "reading between the lines," and of thinking for himself, who has not yet become convinced of the superiority of woollen to linen as a material of underclothing, we, having been fully persuaded in our own mind, advise him to read that pamphlet.

AMERICAN CLIMATOLOGICAL ASSOCIATION.

(Continued from page 357.)

EPIDEMIOLOGY OF INFLUENZA AND ITS RELATIONS TO CATARRHAL-FEVER was the title of a joint paper by Drs. R. G. Curtin and E. W. Watson, of Philadelphia, read by the former. Catarrhal-fever, due to the same specific cause, precedes and is associated with epidemic influenza, which latter represented a most violent outbreak of the more causative influences. Catarrhal-fever appeared a year in advance of the influenza epidemic of 1889. This catarrhal-fever presented a symptom group heretofore undescribed in the literature of medicine. It represents the same morbid process as that productive of influenza. Taking the experience of Australia as a criterion, we had every reason to expect continued manifestations of influenza during the next two years. In Australia the disease had recurred during five successive years, 1885-89, the symptoms being identical with those observed in our own country during corresponding periods of time. The type of influenza which would next appear would closely simulate in symptomatology the local appearance of diphtheritic processes, and would also assume the type of an epidemic cerebro-spinal or spotted-fever. There was no doubt as to the positive contagiousness of the disease.

REPORTS ON THE LATE EPIDEMIC OF GRIPPE.—Dr. A. Alexander Smith, of New York, reported observations upon some of the less common phenomena of influenza, especially as they involved the skin, nervous, mental, and digestive systems. He had noticed several instances of cutaneous symptoms resembling the lesions of scarlet-fever and of measles. An urticaria frequently occurred in cases with marked gastric disturbances. Purpura had also been observed in several instances. Acute mania, not associated with high temperature or with alcoholic habits, had also been noted. The delirium in certain cases resembled that of mania-a-potu in subjects non-alcoholic. In old cases of chronic alcoholism the disease

acted as an injury does in such cases, producing a condition like delirium tremens. Suicidal tendencies he had frequently observed ; homicidal tendencies had been rare ; convulsions, and the many paralyses mentioned by other writers, he had not observed. In certain cases characterized by quite marked gastric intestinal disturbance, he had noted marked jaundice as a complication or sequel. He cited statistics collected from the tables of the Board of Health in New York, bearing upon the mortality from pneumonia, bronchitis, and pulmonary phthisis, during the five years preceding the outbreak of influenza, as compared with the deaths from these diseases occurring during the two years of epidemic grippe. These tables showed a large increase in the percentage from pneumonia and bronchitis, but none from pulmonary tuberculosis. According to Dr. Tracy, at least eight hundred thousand New Yorkers had been affected by the epidemic with a personal attack in 1891, while Dr. Edson placed the number at nine hundred thousand or more. As illustrating the effect of occupation and atmospheric exposure to the development of the disease, these statistics showed that of the police and letter carriers of New York ninety per cent had contracted the disease, the remaining ten per cent constituting the proportion engaged in in-door or clerical duty.

Dr. Curtin, of Philadelphia, read a report prepared by Dr. Watson in conjunction with the reader's description of the disease, as it was observed in Philadelphia, based upon five thousand cases. They had recognized a circulatory, nervous, alimentary, catarrhal, and rheumatic type of the disease, and found that depression of the circulation and nervous system had been the two conditions requiring most vigorous consideration in treatment. Cases of grippe ending fatally did so usually through the involvement of respiratory function, and, secondly, through the medium of heart failure.

Dr. Nunn, of Savannah, described the disease as it appeared in the South. The earlier cases, during the first outbreak, was simple in character, and presented no special difficulty in their management. Later the disease assumed a different type, and appeared to be distinctly a neurosis. All symptoms could be explained, no matter how varied, upon this hypothesis. He had found stimulants most effective in the treatment.

Among these ammonia salts and nux vomica had been most beneficial. Opium he had found attended with very unfavorable results in all cases. He recalled one death undoubtedly due to this cause. Hydrastis had also proven a valuable remedy in the disease. Convalescence had been invariably tedious, and he could recall cases not yet recovered from the effects of attacks incurred two years ago. Among the more remote effects he had noticed a tendency to light up diathetic tendencies—the arthritic would develop rheumatic attacks, etc. A change of climate had always proven beneficial in hastening convalescence.

Dr. Mulhall, of St. Louis, had confined his observations to the effects upon the respiratory organs. The winters during both epidemics had been unusually mild, the rainfall and high winds had been excessive, the snowfall slight, and mean average temperature high. Not many deaths had occurred from uncomplicated attacks at the time, but many deaths within a year succeeding had occurred from pulmonary consumption. The vast majority of cases were not tuberculous when attacked, as proven by microscopical examination. A peculiarity proven by clinical and post-mortem observations was, that the materies morbi of *la grippe* often aroused dormant or latent pathological processes, which became then rapidly fatal. Another peculiarity noted was the long-continued congestions preceding active inflammations, not uncommonly relieved by hemorrhage. The recognition of this peculiarity is an important matter in the lungs, in order to prevent the often-noted cycle of congestion, hemorrhage, pneumococci, tubercle bacilli, and death. This latter clinical picture was proven in patients under his care, by the bacteriological demonstrations of Dr. Ludwig Bremer. As a rule, the disease did not tend to suppuration. A noteworthy result of influenza had been observed by the speaker, in a loss, more or less permanent, lasting in some instances more than a year, of the singing voice in professional vocalists, especially the upper register. He did not believe it possible to determine the question of contagiousness, although it was presumably true. One attack gives no protection. He had observed a recurrence of the disease in one patient five times in two years. The clinical picture and the remarkable sequelæ prove that the nervous

system plays the most important rôle, anatomically speaking. Vaso-motor paresis, peripheral and cerebral, is the dominant pathological feature.

Dr. Ingalls, of Chicago, had observed radical differences in symptoms, referable to the nervous, respiratory, and digestive systems, in the last epidemic, as compared with the year previous in the disease, as it appeared in Illinois. The nervous symptoms were much more pronounced, as manifested in neuralgic affections, prostration, and mental involvement. Derangements of the digestion were more pronounced. The epidemic of last year had been followed by a large number of cases of fever closely simulating typhoid-fever, but lacking some essential features of the latter disease. These fevers were from ten days to two or three weeks in duration. The respiratory symptoms differed in the type of pneumonia observed. In the first epidemic the catarrhal form prevailed, while last year the croupous type was the more frequent. The nasal and throat symptoms were noticeably mild. Pleural affections were more common, and he had observed a tendency to suppuration in the pleural cavity as not uncommon. Tracheitis among the respiratory symptoms was the most common of all, giving rise to a violent cough of spasmodic character easily re-excited weeks or months after recovery by undue exposure. He had seen offensive muco-purulent discharge with this cough. In the treatment he had found the bromides effective for cough, other treatment had been symptomatic.

Dr. Munro, of Boston, also read a report on the subject, based upon peculiarities observed in the disease as it prevailed in the New England States.

In the discussion which followed, Dr. Levick, of Philadelphia, referred to a paper, published by him in 1864, upon the subject of epidemic influenza, which illustrated the remarkably consistency in the symptomatology of the disease regardless of changes in methods of living environment or alterations in race peculiarities. He had described in the paper mentioned a busy delirium like that of mania-a-potu, similar to that referred to in the discussion to-day. Scarlatina-like eruptions, cutaneous lesions resembling measles, urticaria, lichen tropicus, and erysipelatous patches had all been men-

tioned as appearing among the manifestations of the disease as it occurred in 1864. Jaundice he had also noticed and described. He believed the relationship of epidemic cerebro-spinal meningitis, or spotted-fever, to epidemic influenza to be a close one etiologically. In 1864 the two diseases occurred simultaneously as an epidemic. He suggested an identity of the two with only a difference in degree. Gallup, Trent, North, and Job Wilson, writing in the earlier part of the present century, had all advocated the doctrine of identity. If we should have a cold winter this year, he felt confident we might expect an epidemic of cerebro-spinal meningitis.

Dr. Ward said that the disease manifested its most conspicuous action upon the central nervous system, and that such action was of the nature of a functional derangement, not an organic change. One attack did not give immunity from others, as he had known the same patient to suffer several times. Influenza only lit up old pathological processes by reducing the patient's vitality and consequent resistance to disease.

Dr. Ford, of New York, doubted the contagiousness of influenza.

Dr. Musser, of Philadelphia, cited the published experience of Dr. Trudeau, of the Adirondack sanitarium, in support of his belief that the disease was communicable by personal contact.

Dr. Ruedi, of Denver, related the cases of four mountaineers, completely isolated in the Alps of Switzerland, who did not suffer from the disease for months until after one of them had undergone exposure by a short visit to a village in the valley below where the disease was prevalent, he developing the grip three days later, and all his companions, hitherto free, falling victims.

Dr. A. H. Smith, of New York, spoke of the treatment which had been most effectual in his cases. He had used with great benefit in his practice a combination of phenacetin, $3\frac{1}{2}$ grains, camphor, $\frac{1}{2}$ grain, and atropia, $\frac{1}{200}$ grain, which relieved the pain quickly and controlled temperature without any cardiac depression or excessive sweat. He had used quinia as a tonic in convalescence, and had not had a

fatal case or any case of pneumonia as a complication in his private practice, though many cases had undergone a tedious convalescence. Codeine had been of great service in the obstinate irritating cough sometimes observed. He was not able to form any positive opinion as to the contagiousness of the disease.

Dr. Von Ruck, of Asheville, N. C., rather advocated a belief in the personal communication of the disease. In the sanitarium at Asheville, with some forty odd guests, no cases occurred during the first six weeks of the epidemic prevailing in the city. The first cases occurred in servants of the institution having outside communications. Only three cases occurred among the inmates of the sanitarium.

Dr. Fiske, of Colorado, had noted nervous symptoms as peculiarly prominent in cases which occurred in Colorado. He had observed that the attacks during the outbreaks this year and last were markedly different. This year none of the cases had shown any intestinal symptoms. In Colorado invalid consumptives had shown a marked exemption from the disease, and when they did develop influenza, it was invariably of a mild type, and he had no recollection of a single death in a phthisical patient. New patients coming from the East, however, during the past year had almost invariably dated their disease to an outbreak of *la grippe*.

Dr. Johnston, of Washington, did not think it possible to explain the widespread simultaneous development of *la grippe* as being due to personal contagiousness. Epistaxis, which had been referred to in one of the reports as rather a conservative symptom, he had found invariably to be a dangerous complication. Intestinal hemorrhage he had also observed, and the patient narrowly escaped death. He had seen several cases in quite young children, contrary to the belief that young children were exempt.

Dr. Van Bibber, of Baltimore, had met with an experience which tended to establish his belief that the disease was contagious. He had found narcein, in doses of one quarter grain, very valuable in relieving cough and neuralgic pains.

Dr. Smith, of St. Augustine, stated that in Florida the disease did not appear at all during the first year of its prevalence in America. Last year the cases were mild, free from

complications, and with no abdominal symptoms. The mortality was very slight.

Dr. Gilrou, of the United States Army, described a personal attack in which mental despondency was the most marked characteristic. Dr. Levick's description of the disease as it occurred in 1864 was equally appropriate and accurate in its bearings upon his own case.

DIPHTHERIA AT HIGH ALTITUDES.—In a paper upon this subject, Dr. W. A. Jayne, of Georgetown, Col., from observations based upon 68 cases observed personally, reached the conclusion that a high altitude exerted a decided restraining influence upon the bacteria of diphtheria; that few cases developed through contagion, and that bad sanitary surroundings were in a direct ratio to the virulence of the disease. Of the 68 cases recorded the mortality was twenty-five per cent. Twelve died from sepsis, 5 of which were hopeless when first seen. Of the total number of cases, in 32 the formation of membrane was limited to the pharynx, and of these, only one died. In 31 cases the nasal mucous membrane was attacked, and 14 of these cases proved fatal; of 4 laryngeal cases, 2 died. Nasal involvement, as in lower regions and the East, proved most fatal. In the cases which recovered, convalescence was prompt, and the disease was free, comparatively, from complications. Palatine paralysis was not uncommon, but disappeared quickly without treatment.

Dr. Von Ruck, in the discussion, asked if the method of chlorine injection under the membranes, recommended by Siebert, had been tried in the reported cases, and if so, with what result

Dr. Tyndale described the method of Siebert in using chlorine water, referring to the fact that it was only of value in tonsillar deposits.

Dr. Rogers, of Colorado, had noticed that the majority of cases occurring in Denver had been characterized by nasal involvement. Heavy, wet, spring snowstorms, which were not common in Denver, left much moisture, and were always followed by outbreaks of diphtheria. The disease is next to typhoid-fever, in its frequency and malignity, in the high altitudes of Colorado. By the free use of mercury, however, he had overcome his dread of the disease. His treatment

consisted of the bichloride of mercury, in doses of from $\frac{1}{48}$ to $\frac{1}{12}$ of a grain, every two hours, for twenty-four hours, the only limit to the dose being the effect upon the membrane. He did not fear the drug, and by its use in conjunction with hydrogen peroxide locally, he had reduced his death-rate seventy-five per cent. Deaths from nephritis were far less common under mercury than when he had used iron alone.

THE PRE-TUBERCULAR CONDITION.—Dr. J. Hilgard Tyn-dale, of New York, in a paper with this title, expressed the belief that the development of tubercular disease in the individual is largely determined by the presence of an inherent destructive metabolism, as opposed to a constructive metabolism in others, the terms being synonymous with those of scrofulous and fibrous diathesis, according to the nomenclature of Loomis. An investigation of the pretubercular condition involves the acceptance of two maxims or propositions: First, that all more than temporary departures from a condition of well-being of which the patient has been conscious for weeks or months, and which cannot be made to fit into the frame of recognized acute or chronic, functional or organic, disease, represent the pre-tubercular condition. Three stations are to be noted: 1, That made up of the general malaise just mentioned, which is entirely subjective; 2, changes in the respiratory elements of rhythm, pitch, and finally, of quality; 3, dry, followed by moist râles. The first station is the true pre-tubercular condition; the second and third merge into regular tubercular invasion. Second maxim: The pre-tubercular condition is a tubercular colonization in the lungs, as yet undemonstrable by physical signs, engrafted upon those whose general condition has made them fit subjects for invasion.

Dr. Von Ruck, in commenting upon the subject, emphasized the radical importance of an early recognition of the so-called pre-tubercular condition as representing the first stage of tubercular invasion where auscultation and percussion as yet furnished no clue, a condition soon merging into readily demonstrable changes in the respiration, and finally, râles. Instead of sending cases with large cavities, in a hopeless state, to suitable climatic resorts, this much-neglected first stage should claim the attention of physicians as offering a field for positive curative results.

THE WATERS OF RICHFIELD SPRINGS.—Dr. C. C. Ransom read a paper descriptive of the methods in use at the Springs in the administration of the waters and baths. The chemical character of the waters and the indications and contra-indications in disease were elaborated with a view to the selection of appropriate cases by physicians sending patients for treatment. Nearly all forms of skin disease and the various types of rheumatism were benefited or cured by the waters.

THE CLIMATIC TREATMENT OF CHRONIC DIARRHŒA was considered in a paper read by Dr. W. W. Johnston, of Washington, D. C. The observations and conclusions embodied in his paper were applicable not only to forms of chronic intestinal catarrh with diarrhœa, but to those also in which the discharges consist of mucus passed alone or in connection with more or less solid fecal matter. These cases are often most obstinate, and resist all efforts at home treatment. Two clinical varieties were considered: First, the primary and simple form of chronic intestinal catarrh, with or without follicular ulceration, the type of which is the chronic diarrhœa of armies and prisons, observed also in civil life; second, a form most frequently met with in practice, more complex in its origin and nature; it is not primary, but is the outcome of prolonged ill-health characterized by chronic indigestion and various nervous phenomena. The causes are overstrain of the nervous system brought about in men by professional or business cares and anxieties, and in women by frequent child-bearing and a mother's many worries. The patient passes successively through the stages of gastro-intestinal indigestion, hepatic disorders, and constipation; there may be lithæmic, neurasthenic, or gouty symptoms, the stools sooner or later contain mucus, pure or floating in a watery fluid.

This complex disease can sometimes be cured by partial rest from work, by dietetic regulations and medicine. Often, however, only temporary relief, or failure, attend every effort, and radical measures, involving changes of residence and climate, become necessary and must be adopted. Travel is not to be recommended, as the inconveniences, discomforts, and fatigue either delay recovery or aggravate the disease. Ocean voyages are of no benefit except in mild cases. A prolonged residence in a suitable climate is the best procedure,

and the locality selected should have the following conditions : 1, Surroundings which give relief to mental care and supply pleasurable diversion ; 2, an atmosphere which can give the greatest activity to the digestive processes ; 3, meteorological conditions which will not lead to chilling of the surface or " taking cold ;" 4, a warm, equable climate, which is generally a humid one, is not as beneficial as a cool and dry climate both in winter and summer ; a dry, porous soil, a clear sky, with but little rainfall, add to these advantages. In summer, for severe cases, the Catskills, Adirondacks, or White Mountains ; in winter, Western North Carolina, Northern Georgia, and other sections of the Appalachian chain fulfil the indications. Aiken and other similarly situated places were now better for those who cannot stand the cold of greater altitudes. He knew no reason why the high regions of the Rocky Mountain area might not answer as well, but based his paper only upon observations from personal experience and with Eastern climatic resorts. No published data as to the effect of this Western region, including Southern California, were accessible for reference or deduction. The paper was announced as only preliminary to a farther and more extended consideration of a most important subject.

THE INFLUENCE OF HIGH ALTITUDES UPON HEREDITARY TUBERCULOSIS, AND THEIR EFFECTS UPON SOME FORMS OTHER THAN PULMONARY.—Dr. H. B. Moore, of Colorado Springs, contributed a paper upon this subject. The presence of a large number of married phthisical invalids in many of the cities and towns of Colorado, notably Colorado Springs, had rendered pertinent the question as to the influence of these high altitudes upon the inherited predisposition of different forms of tuberculosis. Furthermore, the marked relative immunity from phthisis which exists at high altitudes, together with the radical improvement experienced by sufferers from phthisis who go there, has suggested the possibility that not only the pulmonary form of tubercular disease, but other forms, as bone and joint tuberculosis, may present examples of an analogous immunity and benefit.

With a view to determining these two points, letters of inquiry were addressed to practising physicians of Colorado.

From the answers received, and from personal investigation, the conclusion is justifiable that tuberculosis in any form seldom originates in Colorado, even among those strongly predisposed by heredity. In other words, the climate of high altitudes is an efficient antidote to the tubercular diathesis. In Colorado Springs, for example, with a population of twelve thousand, composed almost entirely of phthisical invalids, notwithstanding the strong hereditary taint necessarily existing, there have been but seven instances of phthisis originating there during its entire history. With regard to cases other than pulmonary the preponderance of opinion was quite decidedly to the effect that their infrequency and the favorable results obtained were quite equal to what obtains in pulmonary phthisis, the inference being that the therapeutic influence is not so much a matter of chest expansion, and improvement in local nutrition consequent upon it, as it is a general tonic influence maintaining a high degree of nutritive integrity throughout the entire system.

THE CLIMATE OF SOUTHERN ARIZONA was the subject of a paper by Dr. Thomas Darlington, of Bisbee, Ariz.

A CONTRIBUTION TO THE HISTORY OF LEPROSY ON THE EASTERN COAST OF THE UNITED STATES.—Dr. W. H. Geddings, of Aiken, S. C., presented a communication concerning the simultaneous occurrence of three cases of lepra in one family. A list of all the cases of the disease that had occurred in Charleston, from 1847-82, constituted seventeen in number. A few years later another case was seen by the writer. She was not a resident of the city, but of a neighboring village on the coast. Including the three described in the present paper, twenty-one well-authenticated cases have occurred within the last thirty-four years in and near Charleston. These cases throw but little light on the etiology of the disease. They were nearly all young adults or persons of middle age. They embrace every grade of society from the descendants of the old Huguenot families, who immigrated to this country hundreds of years ago, down to the humblest domestic servant. Four were Jews, and the others Christians; sixteen were whites, four mulattoes, and one a full-blooded negro. They were all natives, and with the exception of one, whose parents were Irish, their ancestors had lived

in the country for a number of years. As the negroes predominate in this section the fact that only five out of twenty-one were colored would indicate that here this race is less liable to the disease than the whites. In one instance a mother and her daughter were affected with the disease, and in another a father and his son.

In South Carolina the disease appears to be confined almost exclusively to the sea-coast. It will be remembered that this is also the case in Norway. These unfortunates are in no way restrained, and when not too ill, may often be seen walking about the streets of the city. Their appearance excites commiseration, but no one fears to come in contact with them. They live with their families, but mingle freely with the outside world. The number of lepers in the city at any one time has varied from one to three, and as the disease has never evinced the slightest disposition to spread there has never been any fear of its becoming epidemic. How long this will remain the case is doubtful, as Dr. James C. White says that it is spreading rapidly in Louisiana and Florida.

Family History of the Three Cases.—Of the paternal grandparents nothing is known. The father was a Sicilian sailor. He made several voyages between Sicily and New York, but there is no reason to suppose that he ever visited countries in which leprosy is endemic. He soon abandoned the sea and removed to Charleston, where he was engaged in business for a number of years, and eventually died there of congestion of the brain. The mother is a strong healthy woman, of native parentage, fifty-eight years of age, who has borne twenty children, eight of which are still living. On neither side is there any evidence that the ancestors suffered with lepra.

General History of the Development and Course of the Disease.—In the autumn of 1885 Charleston was visited with a severe cyclone, which inundated portions of the city with salt water from the adjacent rivers. The family inhabited a house in the inundated district, and had stored in the cellar some of their carpets and other household furniture. Two days after the flood, when the water had partially subsided, two of the sons, and one of the daughters, all of them apparently in perfect health, undertook to remove the damaged effects, and to accomplish this work were compelled to wade through water

which reached to their hips. The water is said to have presented a dirty greenish appearance. They were engaged in this work for two days. On the evening of the second day, while drying themselves before the open fire, they all noticed a number of bullæ on the outer side of the left leg. These bullæ, at first about half an inch in diameter, gradually enlarged, and finally coalesced into large blebs extending from the external malleolus half-way up the leg. They were filled with a clear, serous fluid of a bright yellow color. In the course of two or three weeks these gradually dried up and desquamated, leaving purple spots, which later on assumed the appearance of white cicatrices. As the bullæ disappeared it was noticed that the affected area was devoid of sensation. The skin then assumed a brownish-yellow color, almost bronzed. Tubercles were developed over various portions of the body, but were larger and more sharply defined on the face and ears than elsewhere. Between the tubercles the skin was much thickened, in some situations hanging in folds, especially where it is loosely attached, as, for instance, below the lower lids. The natural wrinkles over the face were exaggerated into deep furrows. The tubercles over the eyebrows, nose, and ears were more prominent and larger than elsewhere, and with the thickening and wrinkling of the integument gave to the face the lion-like expression so characteristic of leprosy.

The following are, in brief, the clinical histories of the three cases :

CASE I.—F. A.—, is now twenty-four years of age. In the autumn of 1885, while apparently in perfect health, he assisted his brother and sister in removing their damaged effects from the flooded cellar. On the evening of the second day, while drying himself before the fire, he observed a number of blisters on the lower and outer half of the left leg. The subsequent course of the disease corresponded in almost every respect with the general description just given. In this case the disease continued to advance for two years, during which the patient was quite ill and suffered considerably with pain in the parts affected. About the beginning of 1890 the general cutaneous hypertrophy began to diminish and sensation reappeared in many situations which hitherto had been anæsthetic. The general health of this patient is at pres-

ent excellent, and he is quite sanguine of his ultimate recovery.

CASE II.—R. A——, seventeen years of age, a younger brother of F. A——, was affected at the same time and in the same manner as the elder brother. Bullæ filled with serous fluid appeared on the external half of the left leg, chiefly over the ankle and knee, which after drying became white maculæ. These spots were devoid of sensation. The disease soon appeared on the face, then on the trunk, and finally on the upper extremities, pursuing the same course as in Case I., except that the general health was more seriously impaired.

CASE III.—A. A——, twenty years of age, a sister of the two young men, worked with them in the stagnant salt water, and like them had an eruption of bullæ on the outer surface of the left leg. These gradually dried up, leaving in their places white patches which were so devoid of sensation that a needle could be passed through the skin without causing the slightest pain.

Status Præsens.—The patient is slender and somewhat emaciated. The chest is flat and contracted, and for some time past the patient has had cough with evening fever. Her general appearance is that of a person well advanced in phthisis.

This is the only instance on record in this country, the speaker said, in which leprosy has attacked three members of a family at the same moment. All three had worked in stagnant salt water for two days, and were simultaneously attacked while drying themselves before an open fire, and in each case it was the left leg that first presented evidences of the disease, and invariably on its external aspect. Whatsoever the remote cause of the disease may have been, no one will doubt that in these cases the exciting cause was heat acting upon skin, which had been previously softened, and perhaps irritated, by continuous immersion in salt water.

THE INTERNATIONAL CONGRESS OF HYGIENE
AND DEMOGRAPHY, HELD IN LONDON, AU-
GUST 10TH-17TH, 1891.

(From the *Medical Record*. Continued from page 343.)

THIRD DAY, WEDNESDAY, AUGUST 12TH.

SECTION ON PREVENTIVE MEDICINE.

DIPHTHERIA.—A discussion on this subject was opened by Dr. Seaton, who said that the cases admitted into the hospitals of the Metropolitan Asylums Board came from all parts of London. He mentioned the case of a village near London—quite free from diphtheria—in which the construction of a new system of sewerage was followed by a severe outbreak; he thought the disturbance of the soil might have led to the freeing of the germs. He said there was a strong ground for urging on Government the necessity for a systematic inquiry into the causes of the disease.

Dr. Schrevers, of Tournai, said the true origin and the cause of the spread of diphtheria could only be arrived at by examining carefully the results in different countries. In Belgium he had observed that diphtheria and typhoid-fever ran concurrently—where one was severe, so was the other, and *vice versa*—but diagrams constructed from the statistical returns showed one exception—viz., Eastern Flanders. One was led to believe that the connection between these two diseases must be their origin from fecal matter, and the bacteriological researches of Löffler and Eberth agreed with this view. The exception in the case of Eastern Flanders also confirmed this, for the soil here was so humid that it was easily washed clean from all impurities.

Dr. Hewitt, of Minnesota, said diphtheria made its appearance in Minnesota about 1860, and was now the commonest cause of death but two—viz., infantile diarrhœa and tuberculosis. Diphtheria started among the families settled on the banks of the great streams, and for some time remained a family disease, but later it spread to the higher plains, when the increasing business of the country led to increased inter-

course. It was at first confused with ordinary tonsillitis and with scarlatina anginosa. Dr. Hewitt drew the following conclusions from the information he had been able to collect—viz. : 1. That from twenty to thirty years of age women were more liable than men—a fact which he accounted for by the contagiousness of the disease, and women being generally employed as nurses. 2. That forty-four per cent of all cases occurred at or under five years of age.

DIPHTHERIA IN MASSACHUSETTS.—Dr. Abbott, of Boston, read an elaborate paper on this subject, at the close of which he drew the following conclusions :

1. That diphtheria is an eminently contagious disease.
2. That it is infectious not only by direct exposure of the sick to the well, but also through indirect media, such as clothing and other articles which have come in contact with the sick.
3. That the certainty of infection is not as great as in the case of some of the other infectious diseases, notably small-pox and scarlet-fever.
4. That overcrowding, faulty ventilation, and filthy condition of tenements favor its spread.
5. That the influence of defective plumbing is not proven.
6. That its transmission through public and private water-supplies is not proven.
7. That its propagation is favored by soil-moisture, damp cellars, and general dampness of houses.
8. That the poison may remain inactive in houses for a long period.

Dr. Adams, of Maidstone, presented a communication on “The Relationship between the Occurrence of Diphtheria and the Movement of the Subsoil Water.”

A LOCAL EXAMINATION OF THE DIFFERENCE IN SUSCEPTIBILITY TO DIPHTHERIA BETWEEN OLD AND NEW RESIDENTS.—Mr. Charles Paget, of Salford, then read a paper with this title. As the result of his inquiries, Mr. Paget said he found that as the people of a district were more subjected to the continuous influence of their unsanitary surroundings, they were found less fitted to resist the infection of this disease. A shorter average period of residence elapsed before an attack of diphtheria was observed where the mortality rate was highest, and *vice versâ*. The relative incidence of diphtheria during an epidemic period, in respect of length of residence, was thus dependent to no small extent on general sanitary circumstances.

Professor D'Espine, of Geneva, Dr. Jaussens, of Brussels, and Dr. Escherich, of Graz, continued the discussion, and the opinion was expressed that local disinfecting measures were of great use in preventing the spread of the disease.

Dr. Thursfield, of Shrewsbury, said that he had long ago arrived at the conclusion that the ordinarily accepted ideas as to the etiology of the disease were one-sided and misleading. He believed that the failure of sanitary improvements to stop the increase of diphtheria was to be attributed to the dissemination of the disease by very mild, medically unattended, and therefore not notified, cases—generally acting through school agency. More importance should be attached to the fact that the chief influence favoring the incidence of the disease was personal susceptibility. He had, some years ago, in published papers, taken the view expressed by Dr. Hewitt, who laid considerable stress on the connection of the disease with damp houses. He had met with cases in which a very prolonged period of infection had been observed, and thought these might be explained by the fact that relapses might occur in diphtheria.

Dr. Tripe, of Hackney, said that, as the result of thirty-five years' experience, he had noticed that good drainage had but little effect in diminishing the virulence and extent of epidemics of diphtheria. The best method of preventing its spread was by destroying by fire all rags infected by secretions. He believed the disease was spread by contact, and had found that closing the playground was as effective as closing the school.

Dr. Günther, of Dresden, and Dr. Hubert also spoke, and a resolution was passed by the Section to the effect that it was extremely expedient that European governments should make a comprehensive and systematic inquiry into the causes of diphtheria.

SECTION ON BACTERIOLOGY.

IMMUNITY.—A discussion on this subject was opened by Dr. Roux, of the Pasteur Institute, Paris. He said that the great amount of work which had been done on the subject had one point in common—viz., the attenuation of virus and preventive inoculation, the two subjects with which Pas-

teur's name would be associated for all time. With the single exception of vaccination, the only method of conferring immunity against any disease was by the inoculation of the virus of the disease. Pasteur had added the less dangerous method of preventive inoculation by means of an attenuated virus, to which he had applied the term vaccination. The term "attenuated" virus ought to be reserved for virus weakened without being attenuated—*e.g.*, by artificially lowering the vitality of the organism for producing it. Two methods of attenuation had been described by Pasteur—*viz.*: 1, The prolonged exposure of a culture to the air at a suitable temperature; and 2, the passage of the organisms through the bodies of different species of animals. Other methods had also been employed. In any case it was necessary that the attenuation should be effected slowly and gradually, rapid attenuation rendered a virus altogether inactive without impressing on it any hereditary weakness. In whatever way the virus was prepared, it must, in order to confer immunity, be brought into direct contact with the tissues of the animal. Dr. Roux then discussed the theory of phagocytosis, associated with the name of Metschnikoff. Phagocytosis, he remarked, only occurred in refractory animals; in animals susceptible to the disease it was either not to be observed or was incomplete. He then went on to consider the questions whether immunity was the consequence of this power of the cells to include the virulent microbes, or whether immunity might not be due to the absorption of the virus by the cells. Numerous observations showed that the microbes contained within the phagocytes were not degenerated, but were in a condition of full activity. Another demonstration of the importance of the action of the phagocytes was afforded by the fact that even in refractory animals the microbes were found to increase when kept out of the reach of the leucocytes. Thus, if a rabbit were inoculated in the anterior chamber of the eye, where there were no cells, the bacteria grew freely, and their development was only checked when the leucocytes had after a time migrated in large numbers and began to include the microbes. Phagocytosis was thus a very general phenomenon, and one which was very efficacious in checking the advance of the organisms; when it failed the individual

succumbed to the virulence of the bacteria. What attracted the cells toward the microbes, and why were the leucocytes, which in refractory animals destroyed the microbes, incapable of seizing upon them in susceptible animals? Metschnikoff propounded his theory in 1883—a theory which rested on two assumptions—viz. : 1, That the cells were attracted to the microbes in virtue of a special sensibility which they manifested toward all foreign bodies in the tissues ; 2, that this power of seizing upon the virulent microbes in immune animals originated in a habit formed during the earlier struggle with the attenuated virus with which the animal had been formerly inoculated. These preferences of the leucocytes might be more readily explained by assuming that they had a special chemical property analogous to that possessed by the zoöspores of the myxomycetes—viz., that they were attracted by certain bodies and repelled by others. MM. Massart and Bardet had proved that the products of the microbes exerted a very marked chemical action on the phagocytes. It was at the commencement of the disease that the critical struggle took place ; interference on the part of the leucocytes at a later period would be useless, since the microbes would have produced enough poison to paralyze their activity. The theory propounded by Metschnikoff did not exclude the possibility of there being other means of protecting the organism, but it affirmed that phagocytosis had a wider sphere of action and was more efficacious than any other.

Dr. Hans Buchner read a paper on the same subject. He said that down to the present time no general theory of immunity had been formulated. By congenital immunity was meant something specific, dependent on the specific physiological properties, on the one hand of the generating factors of disease, and on the other of the animal body or its individual organs and tissues. With regard to acquired immunity, the experimental conditions of its production were known, but the substance producing the immunity was still unknown. Toxins and toxalbumins must be rejected, also the other metabolic products of bacteria ; there remained, therefore, only the specific albuminous substances formed by bacteria—viz., the bacteriproteins. There were three conceptions with regard to the origin of immunity : 1, Want of nutritive mate-

rial in the tissues and juices, whereby the bacteria were destroyed; 2, phagocytosis; 3, prophylactic substances in the animal tissue-juices. The protective substances were probably albuminous bodies of very unstable composition, and Dr. Buchner proposed the name "alexins" for these bodies.

Mr. Hankin also read a paper. He said the discovery of the bacteria-killing power of blood-serum had led to the view that immunity was caused by a bactericidal action exerted by the blood and lymph of an immune animal. Buchner's hypothesis that this bactericidal power was due to a remnant of "vitality," was unnecessary. He had shown that this power was due to the presence of certain bacteria-killing bodies to which the name "defensive proteids" had been given. That these substances did really play a part in the phenomena of immunity was made probable by the following considerations: 1. While the defensive proteid of the rat could be used to protect mice against virulent anthrax, the defensive proteid of an animal susceptible to this disease possessed a far feeblor bacteria-killing power, and could not be so used. 2. By feeding wild rats on bread and water they could be rendered susceptible to anthrax, and at the same time their defensive proteid diminished in amount. 3. Very young rats, which were known to be susceptible to anthrax, contained only traces of the defensive proteid. He proposed the following physiological classification of defensive proteids: 1, Sozins (defensive proteids present in the normal animal); 2, phylaxins (defensive proteids present in artificially immune animals). Each of these groups was divisible into two subgroups—viz., myco-sozins, toxo-sozins, and myco-phylaxins, toxo-phylaxins—the myco group comprising proteids which acted by killing the microbes, and the toxo group those which acted by destroying microbic products. Mr. Hankin suggested that possibly defensive proteids were the weapons used by the phagocytes in their conflict with the microbes.

Professor Emmerich, of Munich, said bactericides were probably intermediate products of decomposition, a stage in the passing of albumin into fat. Hence it was probable that the blood and tissues of immune animals, which contained matter energetically poisonous to bacteria, must also act as a

remedial agent in infective maladies, if injected subcutaneously. This conclusion had been recognized experimentally in two infectious maladies—viz., swine erysipelas and croupous pneumonia.

Mr. Adami, of Cambridge, said the bacteriological world was at present divided into two opposed camps—viz., those who held that microbes within the system were destroyed by the agency of the living cells, and those who held that the function of microbic destruction was performed by the blood-serum and body fluids in general. Any observer could not fail to be struck with the prevalence of phagocytosis, and it was quite possible to accept both views.

Dr. Klein remarked that ordinary frogs and rats were insusceptible to anthrax, but these animals had been made susceptible thereto by a variety of means, which seemed to indicate that there were certain chemical conditions at work.

Dr. Metschnikoff then spoke. Messrs. Behring and Kitasato, he said, had discovered the bactericidal power of the serum of guinea-pigs inoculated against the vibrio *Metschnikovii*, and had shown that whereas this vibrio developed readily in the serum of guinea-pigs which were susceptible to the malady after its being in the body from three to five hours, it was destroyed in the body of the inoculated guinea-pig; the serum of the inoculated guinea-pig killed the vibrio in a very short time, whereas in the serum of a susceptible guinea-pig the vibrios developed in great numbers. Animals completely inoculated against infection were as susceptible to toxic doses of sterilized cultures as animals not inoculated at all. The inoculated guinea-pigs died after the same dose as those not inoculated, and the inflammatory and febrile phenomena were the same. In the septicæmia of guinea-pigs the phagocytes had the most important action of all the immunity factors. The bactericidal power of the serum, remarkable as it was, did not confer immunity. Behring himself had admitted the insufficiency of the theory founded on the microbicidal power of the body fluids. As proved by Messrs. Vailart and Vincent, the animals which were subject to tetanus were already naturally refractory to the microbe. In this immunity from the microbe it was the phagocytes which played the principal part.

Dr. Wood described the protective influence as probably "a specific memory of the cells" which must be acquired gradually, and Professor Babes thought the protective substance was probably of the nature of albumose as shown by precipitation experiments.

SECTION ON THE RELATION OF THE DISEASES OF ANIMALS
TO THOSE OF MAN.

INFECTIOUS UDDER DISEASE OF THE COW IN RELATION TO EPIDEMIC DISEASES IN THE HUMAN SUBJECT.—Dr. Klein introduced a discussion on this subject. He said that in several epidemics of scarlet-fever brought about by milk, Mr. Power had established that the infectiveness of milk was not due to contagion from a human source, but that probably a pathological condition of milch cows, undiscovered before 1885, played a prominent part in giving to their milk the power to produce scarlet-fever in the human subject. Dr. Klein then referred to three epidemics of scarlet-fever referrible to cow disease. Another epidemic disease referrible to cow disease was the so-called "Edinburgh" disease. Diphtheria was also traceable to cows. Dr. Klein expounded his views on this subject at some length, and was followed by Mr. Armstrong, Medical Officer of Health for Newcastle, Dr. Turner, M. O. H. for East Staffordshire, and Dr. Bostock, M. O. H. for Birmingham, who narrated examples of outbreaks of disease caused by milk.

Professor Crookshank then spoke, and took the opposite view, one which he has previously put forward strongly in opposition to the theory supported by Dr. Klein—viz., that there was no evidence in support of the theory that these specific diseases in the human subject ever arose from eruptions or skin diseases of the cow. Professor Crookshank gave an account of some investigations on the subject which he had conducted for the Veterinary Department of the Board of Agriculture.

Dr. Ostertag, of Stuttgart, thought scarlet-fever was not communicable from man to animals. Loeffler had failed to produce the disease in the cow by inoculation.

Mr. W. Hunting, F.R.C.V.S., and Dr. W. J. Collins spoke against Dr. Klein's views.

Professor Chauveau, of Paris, said that some years ago he had endeavored to transmit the small-pox virus to animals, but had failed. Since then, however, he had been more successful, and had found himself able in every case to communicate the small-pox virus to bovine animals, but he had never succeeded in transforming this small-pox virus into vaccine.

INFECTION OF MEAT, MILK, AND OTHER COMESTIBLES.—Dr. Ballard read a paper with this title, and after discussing the subject very fully drew the following practical conclusions: That if we eat bacon or ham, cold or warm, it is a proper precaution to avoid them if not duly cooked throughout. The grand precaution of all was the very commonplace one signified by the word cleanliness. Every factory where pork was converted into brawn, or hams, ought to be so arranged that light and a draught of air could penetrate everywhere; there should be no corners where dirt could lodge and micro-organisms be cultivated; the rise of ground air should be obviated by cement under the floor, and the place should be kept scrupulously clean. Pantries, etc., should be similarly cared for.

THE INFECTION OF MEAT AND MILK.—Dr. Victor C. Vaughan, of the United States Army, read a paper on this subject. He said such infection might be caused in any one of three ways—viz.: 1, From a diseased condition of the animal from which these foods were obtained; 2, from the inoculation of these foods with specific pathogenic micro-organisms outside the body of the animal from which they were derived; 3, meat and milk might be infected with saprophytic toxicogenic bacteria. The author discussed the subject under these heads, and also remarked that it was not necessary for food to be infected with some specific micro-organism before it could be rendered unfit for food. As an example, a case was mentioned in which milk caused vomiting and purging; it had stood for two hours in a very filthy atmosphere.

Professor Blanchard, of Paris, Professor Brown, and Mr. Fleming, F.R.C.V.S., joined in the discussion.

SECTION ON INFANCY, CHILDHOOD, AND SCHOOL LIFE.

Mr. Diggle gave his presidential address, the chair being meanwhile occupied by Dr. Jacobi, of New York.

OVERWORK IN SCHOOLS.—Dr. Leo Burgerstein read a paper in which he laid down the following propositions : 1, That it was desirable that the question of mental over-pressure should be investigated by exact experimental methods ; 2, that in the meantime school lessons should generally not last longer than three quarters of an hour. These were subsequently carried as resolutions.

EXERCISE IN SCHOOL.—Mr. George White, Chairman of the Committee on Physical Education of the School Board for London, read a paper on “ Physical Education,” which was illustrated by a number of exercises performed by children from a Board School.

Dr. Brosnan read a paper on the same subject, and a discussion followed, after which resolutions to the following effect were carried : That the hours of home work for children in schools should be restricted ; that ample physical recreation be carried out ; that in the interval between the exercises the body should be properly rested.

THE VALUE OF HYGIENE TO WOMEN.—Dr. Schofield read a paper on this subject, and at the close of it proposed the following resolution, which was carried unanimously—viz. : “ That this Congress hereby warmly advocates the instruction of girls and women in personal and domestic hygiene as an integral part of their education.”

SECTION ON CHEMISTRY AND PHYSICS IN RELATION TO HYGIENE.

THE CHEMICAL TREATMENT OF SEWAGE was the title of a paper by Dr. Thresh, in which he gave an account of the various chemical methods employed. With reference to the electrical treatment of sewage, he said that an extended series of experiments on a much larger scale would be necessary to convince the sceptical that this was other than a roundabout way of producing a soluble iron salt to act as a precipitating agent.

Dr. Alfred Carpenter spoke in favor of sewage farms, and several speakers supported his views. At the close of the discussion the following resolution was proposed by the President, Sir Henry Roscoe, and carried, with some dissentients : “ That in the opinion of this meeting the best yet known

method of disposing of the sewage of towns is that of purification and utilization on the land."

SECTION ON NAVAL AND MILITARY HYGIENE.

DIETARY SCALES IN CONNECTION WITH THE HEALTH OF SEAMEN.—Dr. W. Spooner, in opening the discussion of this subject, said the ordinary dietary scales were not fitted to preserve health. They were too monotonous, had too much salt meat, not enough vegetables, and the proportion of different ingredients was not correct. Preserved meat should replace salt meat, and vegetables should be added. On American ships potatoes were always given. Owing to too much meat the nitrogenous ingredients in the present scale were in excess; the saving effected by reducing the quantity of meat might be expended on other articles. If a proper dietary scale were made compulsory, scurvy would in a short time be eradicated.

SCURVY.—Dr. Rae, F.R.S., narrated his Arctic experiences of scurvy. He was surgeon to the Hudson Bay Company's ship *Prince of Wales* in 1833-4, when he was twenty years of age. During two winters in the Arctic regions his party lived practically without vegetables, but their provisions were fresh, and all killed by themselves. The Eskimos used very largely the contents of the deer's stomach in the winter as a vegetable, cutting off a piece and eating it as if it were bread. He strongly recommended cranberries as part of the ration, both in the navy and in the mercantile marine. They were easily preserved with a little sugar. When cranberries were found in the Arctic regions improvement began in all his scurvy patients.

Dr. Collingridge said there could be no question as to the inefficiency of the diet scale, and even this was not obtained at its paper value.

Mr. Swanson said the dietary scale was not at present compulsory, and power would have to be given by Parliament before the Board of Trade could force a scale upon the Mercantile Marine.

(To be continued.)

THE TRUTH ABOUT VACCINATION.

V.

IN reply to Dr. Bell's last article, I wish to say that I am not "devoid of the knowledge of the truth about vaccination as made known through the most authentic sources of information during the last fifty years," nor am I ignorant of the changes of base which the pro-vaccinists have been obliged to make from time to time. When Jenner promulgated his *discovery* (?) he made this declaration: "What renders the cow-pox virus so extremely singular is, that the person who has thus been affected is *forever after secure from the infection of the small-pox.*" Upon this declaration the practice of vaccination was based, and the majority of the profession advocated it not only during Jenner's lifetime, but until about twenty years ago, while many of the older physicians still pin their faith upon the protective virtue of a single vaccination. When it was found that persons who were vaccinated subsequently took the small-pox, and that 90 per cent of all small-pox patients had been vaccinated, then it was claimed that one vaccination was not sufficient, but that a person must be vaccinated in infancy, at puberty, and in adult life. And when it was found that this also failed to protect against small-pox, the profession claimed that vaccination must be performed every two or three years. And now, when even repeated vaccinations have failed to protect against small-pox, the doctors fall back upon the flimsy pretext that the operation is imperfectly performed.

That my quotation to which Dr. Bell objects was imperfect, was due to the fact that I was obliged to cut down my article by two pages, and in doing so I left out portions of the quotation which I had previously written out in full.

In regard to Bousquet's statistics, I would again call the reader's attention to the method in which Dr. Bell computes them in THE SANITARIAN for May, 1891 (pp. 459, 460), and ask a comparison of his figures with mine in the September issue, so that it may be seen which are correct.

If Dr. Bell is correct in his assertion that small-pox is not influenced by sanitation, why does he, with other advocates

of vaccination, resort to quarantine, disinfection, and fumigation whenever a case of the disease is discovered? Why not depend entirely upon their vaunted vaccination? Why does he so completely ignore my quotation of the opinion of Dr. Lawson Tait, of London? It is easy for Dr. Bell to speak of the relations between small-pox and filth as "a long since exploded fallacy," but why does he not give us some authority for his assertions on this subject, and, if it is an exploded fallacy, why do Boards of Health so persistently employ sanitary measures, in conjunction with vaccination, to stamp out small-pox? What does the doctor say to the opinions expressed by the Consulting Physicians of the Board of Health of Lowell, Mass., in their report concerning the last great small-pox epidemic—that of 1871? In speaking of the comparative result of agencies employed to arrest the disease, they report as follows:

"Our experience in dealing with the present epidemic compels us to place isolation before vaccination. The latter has not seemed to afford that protection which has usually been ascribed to it. At particular stages of the epidemic this agency did not arrest the progress of the disease as was expected. Neither in individual cases, has it prevented persons, apparently well vaccinated, from having a violent, and in several instances, a fatal attack of the small-pox. A careful examination of quite a number of very grave cases, at the hospitals, distinctly showed marked cicatrices—some large, well-pitted, and made, as the patients said, by inoculation for the small-pox itself, or by virus from the cow-pox. . . .

"Complete isolation was regarded, in the outset, as an indispensable measure, and experience has shown that this could only be accomplished by removal to the hospitals.

"By recurring to the rapid decline of the epidemic, from September 25th to October 25th, it will be seen how quickly the removal of cases arrested the disease, reducing the number from 78 in the third week of September to 12 in the third week of October, and to one only for the second week after that. The decrease in the number of deaths shows the sudden decline in a more striking manner. It should be borne in mind that removals were not fully made and isolation rendered complete until the last of September. In that month there

were 55 deaths; in the first half of October, 23; last half, seven, and only one thus far in November."

In spite of the attempt made to discredit Dr. Creighton as an authority on the subject of vaccination, the fact remains that he was recognized as an authority on pathology in a former edition of the *Encyclopædia Britannica*; was formerly Demonstrator of Anatomy and Examiner in Medicine in the University of Cambridge, and Attending Physician and Surgeon in St. Thomas's Hospital and Charing Cross Hospital, London; and that he is the author of a number of treatises on various medical subjects. The questions and answers which Dr. Bell quotes from the Second Report of the Royal Commission appointed to inquire into the subject of vaccination are in the nature of a cross-examination on answers previously given, and cannot be properly judged when separated from their context. Dr. Bell's aim, however, seems to be to show that Dr. Creighton did not give ratios in the tables he furnished, while Dr. Creighton persists in stating that his actual figures were such that computations might be made as to the number of cases in proportion to the population. It is right here that we object to Dr. Bell's official statistics, as whenever an attempt is made by vaccination advocates to give the number of deaths per million inhabitants, they base their computations upon a small number of cases. The statistics quoted by me in my first article, and to which Dr. Bell seems to object, were taken from the Forty-sixth Annual Report of the Registrar-General of England, pp. LXII. and LXIV., tables 30 and 32. A reference to these tables shows that in 1838 there were 16,268 deaths; in 1871, 23,062 deaths, and in 1872, 19,022 deaths. Thus, in the last great epidemic in England, the number of deaths was greater than in any other small-pox epidemic in the century, although vaccination had been practised for three quarters of a century, and in 1871 95 per cent of the population were vaccinated. Since 1853, when vaccination was made compulsory by Act of Parliament, the Act being much more stringently enforced in 1867 and 1871, there have been three epidemics of small-pox.

	Date.	Deaths from Small-pox.
1st.	1857-58-59.....	14,244
2d.	1863-64-65.....	20,059
3d.	1870-71-72.....	44,840

Increase of population from first to second epidemic, 7 per cent ; increase of small-pox in the same period, nearly 50 per cent ; increase of population from second to third epidemic, 10 per cent ; increase of small-pox in the same period, 120 per cent.

Deaths from small-pox in the first ten years after the enforcement of vaccination, 1854-63, 33,515 ; in the second ten years, 1864-73, 70,458.

Again, if the doctor wants ratios to uphold his case, we would refer him to table 33, p. LXV., of the report above mentioned, which gives the annual mortality per thousand persons living in London from 1838-83. By this table we see that in 1838 there were 2.16 deaths from small-pox to 1000 persons living, while in 1871 there were 2.42 deaths to the 1000 living, though in the latter year 95 per cent of the population had been vaccinated. These are the official statistics which Dr. Bell and Dr. Abbott so persistently ignore, and which Dr. Abbott did not find in his volume of the Forty-sixth Annual Report of the Registrar-General of England.

In referring to Mr. Biggs's statement, quoted by me in my last article, Dr. Bell concludes his reply with the following reference to my quotation—"implying that the sanitary authorities have lost faith in vaccination—the statement is so palpably false as to merit no reply." The doctor would not make such a statement if he was as familiar with this subject as he professes to be. I would state, for his benefit, that Mr. Biggs was for many years a member of the Leicester Board of Guardians, during the time the question of non-compulsion was settled, and is at present a member of the Hospital and Sanitary Committees of the Town Council. Mr. Biggs gave his testimony before the Royal Commission during its last few sittings, and his statistics and statements withstood all attempts at refutation by the advocates of vaccination.

If Dr. Creighton has no claim to be considered an authority on practical medicine, what shall be said of other men who have given their testimony on this subject after carefully investigating it? I could fill pages by simply enumerating the names of able physicians and scientists who differ from Dr. Bell in their opinions on this subject, but space will only permit us to mention one in this article.

Edgar M. Crookshank, M.B., Professor of Comparative Pathology and Bacteriology in, and Fellow of, King's College, London, and the author of a number of standard scientific works, thus concludes Vol. I. of his exhaustive treatise on the History and Pathology of Vaccination: "The Jennerian method has for nearly a century struggled for existence with the support of the cow small-pox theory and the numerous and ingenious explanations of failures embodied in the assertions of spurious cow-pox, inefficiently performed vaccination, inferior quality of lymph, deficiency in the number and quality of marks, and the misinterpretation of statistics. Inoculation of cow-pox does not have the least effect in affording immunity from the analogous disease in man, syphilis, and neither do cow-pox, horse-pox, sheep-pox, cattle plague, or any other radically dissimilar disease, exercise any specific protective power against human small-pox. Inoculation of cow-pox, horse-pox, and cattle plague have totally failed to exterminate small-pox. . . . There can be no doubt that ere long a system of COMPULSORY NOTIFICATION and ISOLATION will replace vaccination. Indeed, I maintain that where isolation and vaccination have been carried out in the face of an epidemic, it is isolation which has been instrumental in staying the outbreak, though vaccination has received the credit. Unfortunately a belief in the efficacy of vaccination has been so enforced in the education of the medical practitioner that it is hardly probable that the futility of the practice will be generally acknowledged in our generation, though nothing would more redound to the credit of the profession and give evidence of the advance made in pathology and sanitary science. It is more probable that when, by means of notification and isolation, small-pox is kept under control, vaccination will disappear from practice, and will retain only an historical interest."

ROBERT A. GUNN, M.D.

REPLY BY DR. CORBALLY.

THE unavoidable absence of Dr. Bell has left to me the task of replying to Dr. Gunn's last article. It is not out of place for the writer here to remind Dr. Gunn that, although

the review on the "Protective Power of Vaccination," in THE SANITARIAN for November last, was the ostensible occasion for calling out the present discussion on the "Truth about Vaccination," proposed by himself, he has not even alluded to the important facts it contains. In his proposal to discuss the subject he says :

"Yet even Dr. Corbally cannot stand the test of scientific (?) criticism in face of such facts as have been brought to light by Dr. Charles Creighton, of *London . . .* and Professor Crookshank, of *King's College, London, etc.*"

In view of this grandiloquent introduction, it is certainly to be regretted that Dr. Gunn did not apply some of *his scientific criticism* to the article that brought out the discussion.

In his first attempt at *scientific criticism* he says that the article by Dr. Corbally "begins, like nearly all articles on the subject, by assuming that small-pox is a universal disease, and that the majority of mankind must necessarily suffer from it," etc.

If "the majority of mankind must necessarily suffer from it," the doctor will readily see that it may be a very general, but not a *universal* disease. If he will point out the proposition on which he bases his very positive assertion, the writer will be obliged to him, as no such idea was entertained.

In speaking of the Chinese, he says : "They believe it necessary to dislodge the disease by inoculating with small-pox virus."

How can they dislodge a disease that does not exist ? They certainly do not inoculate those having small-pox. It would be absurd.

He contradicts Dr. Morache in a matter on which he has no personal knowledge, and for which he gives no authority. Dr. Morache spent about seven years in China as physician to the French Legation in Peking, was subsequently Professor of Hygiene in the Military School at Val-de-Grâce. Unlike Dr. Simon, as alleged by Dr. Gunn, he had no pecuniary motives for distorting the facts. This is the spirit in which the controversy has been conducted ; erroneous statements are made to be refuted ; men of straw are set up to be knocked down.

The same style of argument has been followed in the last

article, as : "When Jenner promulgated his discovery (?)"
What was it if not a discovery ? The discovery belongs to him as the discovery of America belongs to Columbus. If he thought "that the person who has thus been affected is forever after secure from the infection of small-pox," it was true, no doubt, so far as his observation extended. When Columbus made his discovery, he was not aware of its extent nor of its limitations.

Whether or not there are any of the older physicians who pin their faith to a single vaccination does not alter the case ; each one has the right to be guided by his own judgment. In another place we are told that "the profession claimed that vaccination must be performed every two or three years."

Again it is said : "When it was found that 90 per cent of all small-pox patients had been vaccinated," etc. Oh, no ! doctor, your *scientific criticism* will not prove that. It is not only a fallacy, but a palpable absurdity to suppose it possible to vaccinate 90 per cent of the people. In a previous article in May, page 453, it is stated that 97 per cent were vaccinated. In the article before us it is twice stated that in 1871 there were 95 per cent of the people vaccinated : "Thus, in the last great epidemic in England, the number of deaths was greater than in any other small-pox epidemic in the century, although vaccination had been practised for three quarters of a century, and, in 1871, 95 per cent of the population were vaccinated." He then gives two tables, and says : "By this table we see that in 1838 there were 2.16 deaths from small-pox to 1000 persons living, while in 1871 there were 2.42 deaths in the 1000 living, though in the latter year 95 per cent of the population had been vaccinated."

"These," he says, "are the official statistics which Dr. Bell and Dr. Abbott so persistently ignore." Certainly, they ignore them if they are based on the supposition that 95 per cent of the people were vaccinated, and for the further reason that in 1871 small-pox was of unprecedented severity in all parts of the world. Such platitudes are not arguments. The number of vaccinations given would not be possible unless the vaccinator followed the accoucheur and the midwife, and then it would not be practicable, because many children would be sick, and many would object to allow very young babies to be vaccinated. There is no country in which the law compelling

vaccination is more strictly enforced than in Prussia ; but even there the government does not require the child to be vaccinated before it is a year old, and not then if it is sick, nor until a year after its recovery. Does any intelligent person believe that, even in Prussia, 95 per cent of the population can be vaccinated ? The doctor has too much good sense to ask his intelligent readers to believe it.

Dr. Gunn and Dr. Bell may be both correct regarding the influence of sanitation on small pox, but each looks at it from a different standpoint. There are two propositions involved in this subject, each independent of the other. One applies to the locality, to the surroundings ; these, if they contain small-pox germs, must be purified, fumigated, disinfected. The other applies to the individual. He cannot be fumigated nor disinfected further than is necessary to prevent the excreta and the exhalations from infecting others ; but the system can be so far *sterilized*—if the term be allowed—as to make it proof against the disease, and prevent the germs from living and multiplying in the system. If the house or other location be infected, all germs must be destroyed, that they may not develop the disease in those not protected. Every method of purification and disinfection is then desirable, and, if it were possible to destroy all small-pox germs, the disease would become extinct, and no one would need to be vaccinated nor to use any prophylactic measure.

Vaccination is a prophylaxis which prevents the germ from multiplying in the system. But the difficulties met with are obvious. Sanitation, no matter how perfect it be made, will never destroy all the germs ; some will find a shelter somewhere, and will spread as soon as liberated and the conditions for their development offer. Vaccination will never destroy the disease, because it will be impossible to make it so perfect that every one will be protected. Vaccination and sanitation are considered the practical and most efficient means of preventing the ravages of small-pox. No principle, as auxiliary to vaccination, was more earnestly insisted on than isolation and thorough disinfection, to prevent the spread of the disease in the article which Dr. Gunn proposed to demolish by his "*scientific criticism*." As he seems to have overlooked it, we reproduce it from page 387 of THE SANITARIAN for November last. "Facts, however, so far as observed, go to

prove that vaccination and even revaccination will never succeed in driving the disease from the community unless it is to be supposed that the 16,000 deaths yearly from small-pox in Italy occur solely among the unvaccinated—an assumption which would be absurd," etc., on "The Protective Power of Vaccination."

From the same number, page 388, the following paragraphs are taken :

"Dr. Barry's Report on the Epidemic of Small-pox in Sheffield, England, is an exhaustive one, and important on account of the number of inhabitants and the severity of the attack. The estimated population of the city was 327,227, and the number of houses 59,807. The age of each individual was obtained, the date of vaccination of each, and a history of all the cases.

"When the disease had reached its height—at the above date—6088 cases and 590 deaths had been registered. The inhabitants, as well as the medical profession, gave willing assistance, so that a history was made of every case.

"Dr. Barry himself investigated in detail the more important classes of small-pox, making personal inquiry into each, as well as all cases fatal or not in children, under ten years ; cases said to have occurred after previous small-pox or after revaccination were also inquired into and carefully noted. On these investigations and on previous records of the disease this report is based."

The following extract is taken from page 389 :

"The general results were as follows : for every 100,000 vaccinated children there were 9 deaths, and 4400 for unvaccinated.

"Under the general circumstances of the Sheffield epidemic, therefore, the *vaccinated children* had, as compared with the *unvaccinated children* living in the town, a twenty fold immunity from attack by small-pox, and had four hundred and eighty fold security against death by small-pox."

"When vaccinated children were living in the same invaded house with unvaccinated, the death-rate of the vaccinated was 1 in 1000, and of the unvaccinated, 1 in 381. It may be remarked that all persons under ten years of age are included in the term children.

"For 100,000 persons over ten years old, and twice vaccinated, 100 deaths, and for the unvaccinated, 5100 deaths.

"The twice vaccinated over ten years of age had, therefore, as compared with the unvaccinated, six hundred and forty fold greater security against death."

Dr. Bell no doubt entertains great respect for Lawson Tait, *of London*, but he wishes it to be understood that he would as soon consult Dr. Gunn on a case of abdominal surgery as Lawson Tait, *of London*, on a question of vaccinology.

Evidently, from Dr. Gunn's point of view, if Mr. Tait could be induced to abandon gynecology and become a practical antivaccinist, he might win the everlasting gratitude of the world, stamp out small-pox, and save thousands of lives where he now saves one.

Who are the consulting physicians of the Board of Health of Lowell? They say: "The latter"—that is, vaccination—"has not *seemed* to afford that protection which has usually been ascribed to it." The extract is vague and general.

Dr. Creighton is one of Dr. Gunn's fetiches; but Dr. Creighton discredits himself in his reply to a question as given on page 331 of THE SANITARIAN, for October last, and quoted by Dr. Bell:

"That position was departed from later on, I admit; they may have been mistaken; but I am not going to endorse the statement that they were mistaken."

That does very well for the special pleader, but not for the man who is seeking for "The Truth About Vaccination."

Crookshank is the other of Dr. Gunn's heavy guns. He is inclined to be facetious, and would effect by ridicule what he fails to do by argument. This extract is in his *ad captandum vulgus* style.

"The Jennerian method has for nearly a century struggled for existence with the support of the cow small-pox theory." "*cow small-pox*" must seem very forcible.

If the Jennerian method has struggled so long for existence, it must have wonderful vitality, and be gaining greatly in strength, since in England, according to Dr. Gunn's article, 95 per cent of the population are vaccinated.

Again Dr. Crookshank says:

"Cow-pox does not have the least effect in affording immunity from the analogous disease in man—syphilis—and neither do [nor do?] cow-pox, horse-pox, sheep-pox, cattle

plague, or [nor?] any other radically dissimilar disease exercise any specific protection against human small-pox." A good array of titles, which must be more familiar in *England* than here. Indeed, the whole of Dr. Gunn's artillery seems to be drawn from England. What is "the analogous disease in man [to] syphilis?"

In reviewing such statements, the apothegm "*Difficile est satiram non scribere*" is specially applicable.

T. P. CORBALLY, M.D.

AN EARLY PROOF OF THE VALUE OF VACCINATION.—A correspondent of the *British Medical Journal* sends to it the following extract from a French newspaper of October 3d, 1804: "Six black children, the first who had ever been vaccinated at the island of Réunion, and from whom 5000 people were vaccinated, were shipped on board the vessel *Jeune Caroline*, bound for one of the Seychelles Islands, to perform quarantine for small-pox. The six children were three months on board the ship, eating, drinking, and sleeping with the sick; during the time of quarantine they were inoculated with the virus taken from the pustules of the diseased passengers, by large incisions made on both arms. From the report made at the time and communicated to the Central Society of Vaccine by the Minister of the Home Department, it was found that, although these six children had slept under the same blankets, and in contact with the pustules of the sick, eating and drinking out of the same vessels, and having been inoculated with pus from the patients who ultimately died of the disease, they were all preserved from the contagion, and were, during the whole time, in perfect health. The proof and counter-proof is one of the most severe tests ever performed, and ought to have a marked place in the history of vaccination. The fact of six children having lived in perfect health on board a small ship infected with small-pox, having on board twenty blacks with confluent small-pox—six of whom died—twenty to twenty-five others with dry crusts all over the body, with seven deaths before their arrival at the quarantine station, all packed in a small space between decks, is perhaps the most crucial test ever witnessed of preservation by vaccination."

THE PROGRESS OF INFECTIOUS DISEASES AND DEATH RATES AT THE MOST RECENT DATES.

COMPILED BY HARRY KENT BELL, M.D.

CALIFORNIA.—Reports from sixty-three cities, towns, and localities, having a population of 675,551, during September, show 929 deaths to have occurred from all causes. Annual death-rate, 16.44. Deaths from consumption, 129; pneumonia, 38; bronchitis, 13; and congestion of the lungs, 3. Croup and diphtheria caused 43 deaths; typhoid-fever, 28.

San Francisco, 330,000: Deaths during the month of September, 465. From consumption, 60; acute lung diseases, 38; croup and diphtheria, 24; typhoid-fever, 9. Death-rate, 14.08.

Los Angeles, 53,394: Deaths, 74. From consumption, 14; acute lung diseases, 3. Death-rate, 16.52.

Oakland, 50,000: Deaths, 53. From consumption, 7; acute lung diseases, 2. Death-rate, 12.61.

CONNECTICUT.—The mortality report for September comprises one hundred and sixty-eight towns. There were 1105 deaths reported in the State during the month. This was 143 less than in August; it was 99 more than in September, 1890, and 94 more than the average number of deaths in September for the five years preceding the present.

In the first nine months of the year the number of deaths was 10,125, being 268 less than in the corresponding months of last year, and 545 more than the average in the same months for the last five years.

The death-rate was 18.2 for the large towns; for the small towns 16.6, and 17.7 for the whole State.

The deaths from zymotic diseases were 334, being 30.2 per cent of the total mortality against 36.5 per cent in August.

New Haven, 86,045: Deaths, 115—under five, 37; from zymotic diseases, 18. Death-rate, 13.2.

Hartford, 53,230 : Deaths, 80—under five, 25 ; from zymotic diseases, 17. Death-rate, 14.6.

Bridgeport, 48,866 : Deaths, 66—under five, 25 ; from zymotic diseases, 18. Death-rate, 15.2.

DISTRICT OF COLUMBIA, 250,000 : Reports for four weeks ending September 26th, 451 deaths, of which number 215 were colored. Annual death-rate per 1000, 22.86.

From zymotic diseases there were 143 deaths, and from consumption, 51.

ILLINOIS.—*Chicago*, 1,200,000 : Deaths during the month of September, 1966—961 under five years of age. Death-rate, 19.66. From zymotic diseases, 676 ; consumption, 134.

IOWA.—*Davenport*, 28,500 : Reports for September, 37 deaths—12 under five years of age. Annual death-rate per 1000, 15.6.

LOUISIANA.—*New Orleans*, 254,000 : Reports for two weeks ending September 19th, 203 deaths, of which 73 were colored, and 53 were under five years of age. Annual death-rate, 24.85 per 1000.

There were 35 deaths from zymotic diseases and 29 from consumption.

MARYLAND.—*Baltimore*, 455,427 : In September the total deaths were 760, an increase of 107, compared with the corresponding month of September, 1890. Of these, 600 were white and 160 colored ; a death-rate of 18.75 per 1000 for the former, and 27.04 per 1000 for the latter. The death-rate for the whole population was 20.04 per 1000. 76 persons died from infectious diseases, 78 from consumption, and 56 from cholera infantum. 334, or 43.81 per cent of the total deaths, were in children under five years of age.

During the month 179 cases of infectious diseases were reported, an increase of 39 over the preceding month.

MASSACHUSETTS.—*Boston*, 459,062 : During September, 1891, deaths reported, 853, of which number 347 were under

five years of age. Annual death-rate per 1000, 22.29. From zymotic diseases, 175, and from consumption, 111. Cases of contagious diseases reported, 320.

MICHIGAN.—For the month of September, 1891, compared with the preceding month, the reports indicate that small-pox, puerperal-fever, membranous croup, typhoid-fever, pleuritis, diphtheria, influenza, cerebro-spinal meningitis, remittent-fever, and bronchitis increased, and that measles, whooping-cough, and inflammation of brain decreased in prevalence.

Compared with the preceding month, the velocity of the wind was greater, the prevailing direction was southwest (instead of west), the rainfall was much less; the temperature was lower, the absolute humidity was slightly less, the relative humidity was slightly more, the day and night ozone were less.

Compared with the average for the month of September in the five years 1886-90, cerebro-spinal meningitis, pleuritis, scarlet-fever, small-pox, cholera infantum, and typhoid-fever were more prevalent, and membranous croup, typho-malarial-fever, inflammation of brain, pneumonia, measles, erysipelas, influenza, and puerperal-fever were less prevalent in September, 1891.

For the month of September, 1891, compared with the average of corresponding months in the five years 1886-90, the velocity of the wind was the same, the prevailing direction was southwest (instead of easterly), the temperature was higher, the rainfall was much less, the absolute humidity was more, the relative humidity was less, the day and night ozone were less.

Including reports by regular observers and others, diphtheria was reported present in the month of September, 1891, at eighty-six places; scarlet-fever, eighty-four; typhoid-fever, one hundred and fifty-eight; measles twenty-two, and small-pox, two places.

Reports from all sources show diphtheria reported at twenty-four places more, scarlet-fever at five places more, typhoid-fever at one hundred places more than in the preceding month; measles at same number, and small-pox at two places.

Detroit, 220,000: During September, deaths, 353—under

five years of age, 97. Death-rate, 19.52. From zymotic diseases, 129 ; from consumption, 24, and from pneumonia, 15.

MINNESOTA.—The Secretary of the State Board of Health reports for three months ending August 31st, 2287 deaths in 1,301,826 population. Enteric-fever, 54 ; scarlet-fever, 28 ; diphtheria and croup, 86 ; measles, 7.

Minneapolis, 164,738 : Month of September. Total deaths, 146, including phthisis pulmonalis, 12 ; enteric-fever, 17 ; scarlet-fever, 1 ; diphtheria, 9 ; and whooping-cough, 3.

Winona, 18,208 : Month of September. Total deaths, 20, including 1 from diphtheria.

St. Paul, 150,000 : Deaths during September, 120—58 under five years of age. Deaths from zymotic diseases, 49 ; from consumption, 7. Death-rate, 9.60.

MISSOURI.—*St. Joseph*, 52,324 : Month of September. Total deaths, 67, including phthisis pulmonalis, 5 ; enteric-fever, 2 ; diphtheria, 6 ; and croup, 1.

MONTANA.—*Butte City*, 10,723 : Year ended June 30th, 1891. Total deaths, 678, including phthisis pulmonalis, 21 ; enteric-fever, 31 ; scarlet-fever, 8 ; diphtheria, 12 ; croup, 16 ; measles, 2 ; and whooping-cough, 2.

NEW JERSEY.—*Paterson*, 78,358 : Reports for the fiscal year ending March 20th, 1891 : Total deaths from all causes, 1712—760 under five years of age.

From zymotic diseases there were 394 deaths ; from consumption there were 204, and from lung diseases other than consumption, 306. Death-rate per 1000 for the year, 21.84.

Deaths during September, 151—72 under five years of age. Death-rate, 18.5. Deaths from zymotic diseases, 56 ; from consumption, 11.

NEW YORK.—The Secretary of the State Board of Health reports that mortality reports from 138 cities, villages, and large towns, having an aggregate population of 4,311,000, show the total number of deaths from all causes in August to have been 8913, making a death-rate per 1000 of 24.34 per annum ; in July the death-rate for the same places was 25.00,

and in June 22.78 ; 50.4 per cent of the deaths in these localities were under five years of age, and 31.0 per cent of the deaths were from zymotic diseases, 23.3 per cent being from diarrhœal diseases, nearly one fourth of the total urban mortality. Of 1800 deaths occurring in rural districts, 28.0 per cent were of children under five years of age, and 23.0 were from zymotic diseases, 18.5 being from diarrhœa. For the State these proportions vary little from the average for six years, the zymotic and diarrhœal mortality being a little lower than the average. Typhoid-fever shows the usual increase, which always begins in August and continues through the fall months ; the increase over July is chiefly in the maritime district, which ordinarily has a lower death-rate from this cause than the other sanitary districts. There were fewer deaths from scarlet-fever, measles, and diphtheria than in July, and a moderate increase from whooping-cough. There were more deaths than usual from accidents, chiefly from drowning and railway injuries.

New York, 1,680,796 : Total deaths, 3648—1710 under five years. Death-rate, 25.56. Zymotic diseases per 1000 deaths from all causes, 363.30. Deaths from consumption, 399.

Brooklyn, 862,155 : Total deaths, 1758—971 under five years. Death-rate, 24.10. Zymotic diseases per 1000 deaths from all causes, 273.82. Deaths from consumption, 147.

Albany, 100,000 : Total deaths, 168—58 under five years. Death-rate, 20.16. Zymotic diseases per 1000 deaths from all causes, 223.53. Deaths from consumption, 28.

Syracuse, 88,000 : Total deaths, 180—80 under five years. Death-rate, 24.55. Deaths from zymotic diseases per 1000 deaths from all causes, 411.11. Deaths from consumption, 14.

Buffalo, 255,000 : Total deaths, 601—348 under five years of age. Death-rate, 28.24. Deaths from zymotic diseases per 1000 deaths from all causes, 400.00. Deaths from consumption, 48.

Rochester, 138,327 : Total deaths, 256—110 under five years of age. Death-rate, 22.14. Deaths from zymotic diseases per 1000 deaths from all causes, 251.56. Deaths from consumption, 17.

Health reports the following : In fourteen towns, with 52,298 white and 39,628 colored inhabitants, there were during the month of August 58 deaths among the whites and 84 among the colored ; the respective annual death-rates were 13.3 and 25.4. Deaths under five years of age numbered 63.

There were 27 deaths from diarrhœal diseases, 16 from consumption, 3 from pneumonia, and 6 still-born.

Wilmington, 21,000 : Total deaths, 41—19 under five years of age. Annual death-rate, 23.4 per 1000.

Raleigh, 15,000 : Total deaths, 24—14 under five years of age. Annual death-rate, 19.2 per 1000.

OHIO.—*The Monthly Sanitary Record* reports that in seventy cities and towns, with an aggregate population of 1,234,252, there were, during the month of August, 1843 deaths, of which number 727 were under five years of age. Deaths from zymotic diseases numbered 633, and from consumption, 168.

Cincinnati, 300,000 : Reports for September, 417 deaths—167 under five years of age. From zymotic diseases there were 84 deaths, and from consumption, 47. Annual death-rate per 1000, 16.68.

Columbus, 101,945 : Reports for September, 101 deaths—34 under five years of age. From zymotic diseases, 31 deaths, and from consumption, 19. Annual death-rate, 11.88 per 1000.

Toledo, 82,652 : Reports for September, 103 deaths—18 under five years of age. From zymotic diseases, 31 deaths, and from consumption, 7. Annual death-rate, 14.84 per 1000.

Mansfield, 15,000 : Reports for September, 18 deaths—5 under five years of age. From zymotic diseases, 3 deaths, and from consumption, 4. Annual death-rate, 14.4 per 1000.

PENNSYLVANIA.—*Philadelphia*, 1,069,264 : In the four weeks ending September 26th, there were 1489 deaths, of which 698 were under five years of age. Annual death-rate per 1000, 18.16. From zymotic diseases there were 324 deaths, and from consumption, 151.

Pittsburg, 247,000 : Reports for four weeks ending September 26th, 403 deaths, of which number 192 were under five years of age. Annual death-rate, 21.16 per 1000. From

zymotic diseases there were 131 deaths, and from consumption, 28.

RHODE ISLAND.—*Newport*, 19,457 : Reports for September 50 deaths, including consumption, 2 ; enteric-fever, 4 ; diphtheria, 1.

TENNESSEE.—*Memphis*, 64,495 : Month of September. Total deaths, 113, including phthisis pulmonalis, 14 ; enteric-fever, 7 ; diphtheria, 6 ; and whooping-cough, 2.

Nashville, 76,168 : Month of September, 1891. Total deaths, 59, including phthisis pulmonalis, 16 ; enteric-fever, 5 ; and whooping-cough, 1.

TEXAS.—*El Paso* : Removal of Quarantine against Mexico. Under date of September 30th, 1891, the United States Sanitary Inspector at El Paso, Tex., reports the removal of the State quarantine against yellow-fever for immigrants and passengers coming from supposed infected places in Mexico.

VIRGINIA.—*Lynchburg*, 19,709 : Month of September, 1891. Total deaths, 33, including phthisis pulmonalis, 7 ; enteric-fever, 2 ; and diphtheria, 1.

WISCONSIN.—*Milwaukee*, 230,000 : Deaths reported during September, 379, of which 123 were under five years of age. Annual death-rate, 19.77 per 1000. From zymotic diseases there were 134 deaths, and from consumption, 23.

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

ARISTOL IN THE TREATMENT OF PULMONARY TUBERCULOSIS.—*La Semaine Médicale* reports that on September 15th, 1891, M. Herard read before the Paris Academy of Medicine a report by Dr. Nadaud upon this subject.

After having observed the excellent effects of Aristol upon scrofulo-tuberculous lesions, and found that Aristol was per-

fectly innocuous in internal medication, M. Nadaud decided to make use of hypodermic injections formulated as follows :

Oil of sweet almonds (sterilized), 100 ccm.

Aristol..... 1 ccm.

The solution should be filtered.

Nadaud's first injections were made upon a child aged seven years, who, after an attack of coxalgia, had developed several abscesses followed by fustulous tracts. One cubic centimetre of Aristol was injected daily. After twenty-five days of treatment there was no trace of suppuration to be seen.

In consequence of this result Dr. Nadaud decided to test the value of hypodermic injections of Aristol in the treatment of pulmonary tuberculosis.

Twenty-three patients suffering from tuberculous lesions of the lungs were successively treated by injections of Aristol without any other medication whatever.

In seven cases the amelioration was so great as to induce the belief that complete cures had been effected. The treatment covered from twenty-five to thirty days. The amelioration has continued up to the time of this writing, *i.e.*, from three to four months.

In five of the twenty-three cases there was a prompt amelioration, but a month after the cessation of treatment some symptoms were observed which seemed to call for a second series of injections. Generally the relapse was of slight importance, and the patients in this category soon resumed their habitual occupations. In no case was it necessary to make a third series of injections.

The rest of the cases are still under Aristol treatment.

In concluding his paper Dr. Nadaud said : " The effects of Aristol are promptly observed usually on the sixth or seventh day of medication, and are first manifested by a diminution of the cough and a suppression of the night-sweats."

After twenty to twenty-five days of treatment we generally find that the patient has increased in weight.

Aristol gives its best results in the first and second stages of pulmonary tuberculosis. The injections do not cause inflammation, irritation, abscess, eschar, or induration.

THE NORMAL FORM OF THE FOOT AND THE ORIGIN OF DEFORMITIES, from defects in the shaping of shoes, has been the subject of a communication to the Anthropological Society by M. Manouvrier. Mayer's description of the normal foot is that of the babe in case the toes are parallel. According to M. Manouvrier, the anatomical axis of the foot should pass between the second and third toes. The normal foot has the form of a fan and not of a lozenge, as we see it when distorted by wearing badly shaped shoes. There are no normal feet to be found in Paris. The Indian who distorts the shape of the skull does not think himself more ridiculous than those who deform their feet.

M. Manouvrier also describes the mechanism of ingrowing nails, and blames the form of the shoe, as happens in the case of bunions, callosities, and different forms of papillary indurations caused by the badly formed shoes causing excessive pressure on some parts, and by local friction.


M. Lagneau mentioned a case of complete distortion of the great toe, which overlapped the others, and remarked, as Broca had done, that the tendon in such cases increases the deformity. Amputation is the only remedy in such cases.

M. Bertillon pointed out the fact that the little toe is frequently found atrophied and overlapping the others. M. Manouvrier said that this discussion has raised a very important question, and one which should interest every lover of his country. This will be the general opinion when it is known that on the day after a forced march it is found that thirty per cent of the foot soldiers suffer from the effects of badly fitting shoes, which have caused more or less deformity.

—*Le Progrès Médical.*

GREASE CAN BE TAKEN OUT OF WHITE MARBLE by the application of whiting or Fuller's earth saturated with benzine, and allowed to stand a short time after application. Another means is to rub well over the marble a mixture composed of two parts of washing soda, one part of ground pumice stone, and one of chalk, all finely powdered and mixed into a paste with water, finally washing off with soap and water.

EDITOR'S TABLE.

 ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, Brooklyn, N. Y.

THE OCEAN ATMOSPHERE.

MORE than thirty years ago, he who is now editor of THE SANITARIAN wrote :

“ The northeast winds of the Atlantic States are damp and unhealthful, because they sweep down the fogs and mists of a northern sea-shore. And the southeastern and southerly winds are clear, dry, and wholesome, because they are from warmer latitudes, and from the pure surface of the ocean. *Sea air* is, indeed, the type of purity, and the most promotive of health. In sea air, pure water is the only isolation. The deposit of salt sometimes observed on board ship is from the spray on the sails, from which it has been blown or shaken ; and this salt may possibly be borne up by strong winds, and thus subjected to respiration. Yet considering the perfect solubility of these molecules of salt in the fluids of the system, and the very small amount which can, under any circumstances, be thus conveyed, it can under no state of affairs be incompatible with the most delicate organic function.

“ The salts of the sea do not communicate their properties to the air, because they are not volatile, and never exist in a state of vapor. And owing to the salts which the sea holds in solution, evaporation of the sea water takes place with more difficulty than fresh water, or of water containing substances easily decomposed by contact with the sun's rays ; consequently the air is damper on sea-coasts and river-banks and in many interior places than it is at sea.

“ Cold and heat are much less intense or oppressive in the same latitudes at sea than on land ; and there is a much greater equality of temperature for night and day. While, from the greater purity of the atmosphere and its lowest stratum, the air is more condensed and concentrated—all combining to promote the most healthy exercise of the respiratory function.

"Light, too, is a collateral benefit of sea air; and doubtless not a little of the rigidity of tissue and hardness which characterizes the sailor is owing to this cause. Free access of light favors nutrition and regularity of development, and contributes to beautify the countenance; while deficiency of light, especially in early life, is usually characterized by ugliness, rickets, and deformity, and is a most fruitful source of scrofula.

"Sea air proper possesses no deleterious qualities whatever. The ill effects sometimes attributed to it are usually owing to the want of ship ventilation and due regard to cleanliness.*

"Moreover, the higher electrical state of, and the more constant presence of ozone in, the atmosphere, the complete absence of suspended matters, barring certain exceptional regions, and the more common prevalence of the winds than on land in the same latitudes, all contribute to the general salubrity. . . . The influence of the ocean air-currents is most powerfully felt far out at sea in the trade-wind regions. Differing as these winds do in many respects from anything that is experienced on the land, it is not surprising that they should, as they do, impress upon many persons an exhilarating effect peculiar to themselves. To many nervous invalids, especially, the 'champagne atmosphere of the trades,' as it is not inappropriately called, is a tonic and stimulant of the most powerful kind, scarcely attainable by any other means."†

Yet we find the following excerpt from a recent number of *Deutsche Medicinische Zeitung*, going the rounds of the American medical press, for its novelty to their editors apparently—presumably because from abroad :

"SALTS OF THE SEA AIR.—Dr. Friedrich, of Dresden, combats the view that winds, especially easterly winds, cause the removal of the salts from the sea water and their more or less general dispersion. The author quotes in support of his own view a large number of old and modern works, and adds to these the results of his own experiments. From these it appears that sea air, as such, contains no salts at all, and that its saltiness, both at sea and on the shore, results from infinitesimal particles of the water dispersed by the waves and

* "Knowledge of Living Things." By A. N. Bell, A.M., M.D., 1860, pp. 229-231.

† "Climatology and Mineral Waters of the United States." By A. N. Bell, A.M., M.D., 1885, pp. 93-94.

tide, while currents of air cause the further distribution of the finest saline particles. He denies that evaporation contributes to the presence of salt in the sea air. The salt found in plants near the coast has the same origin as that in plants at some little distance. It is caused by meteoric water, which always contains chlorides. These chlorides are present in greater quantity on the coast because the humidity is greater and more frequent, and larger deposits take place. The value of the sea air for therapeutic purposes is also, he believes, not due to the presence of salt, but to the greater humidity, purity, and density of the air, as well as to its more uniform composition. In view of other observations, Dr. Friedrich does not dispute the favorable influence of the greater quantity of ozone, but he lays particular stress on the fact that, to be of good and permanent effect, the treatment of serious cases, especially of chest affections, must be undertaken in a suitable climate and a favorable situation. Even there a real improvement and permanent cure cannot be expected in from four to six weeks, but requires a repetition of the treatment or a stay of some months."

THE AMERICAN PUBLIC HEALTH ASSOCIATION held its Nineteenth Annual Meeting at Kansas City, Mo., October 20th-23d, according to announcement. The sessions were held in Warder Grand Opera House. The meeting was grandly received by the citizens, but was less numerously attended by members than usual. Its chief stand-bys were in force, however, and the papers read and the discussions thereon will favorably compare with those of previous meetings.

A particularly gratifying feature was the large delegation from Mexico, representing the national health service of that country, and the effort now in progress for redeeming the City of Mexico and other localities from unsanitary conditions which have hitherto stood in the way of otherwise one of the most salubrious and inviting countries in the world. The selection of the City of Mexico as the next place of meeting of the Association will doubtless do much toward promoting public sanitation in that country, and proportionally lessen the danger of commerce in yellow-fever from her seaports in relation with the United States.

An abstract of the proceedings and several of the papers in full will appear in our next number.

LITERARY NOTICES AND NOTES are unavoidably postponed to our next issue.

THE SANITARIAN.

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NUMBER 265.

THE AMERICAN PUBLIC HEALTH ASSOCIATION,
AND THE CHIEF SUBJECTS OF ITS ATTENTION
DURING THE YEAR 1891.

ANNUAL ADDRESS AT THE NINETEENTH ANNUAL MEETING,
KANSAS CITY, MO., OCTOBER 20TH, 1891.

By FREDERICK MONTIZAMBERT, M.D., Edin.; F.R.C.S.; D.C.L.; Medical
Superintendent Canadian Quarantine Service, Quebec, *President*.

IN the offering of his annual address to a public gathering such as this, the President of the American Public Health Association has, as it seems to me, a twofold duty to fulfil. This follows naturally from the twofold nature of his audience. He has, in the first place, to speak to those present who are strangers to the Association, and to endeavor to interest them by some account of its general scope and working. In the second place, it may well be expected by the members of the Association itself that some reference, however brief, should be made to the paths along which progress has been made since the last annual meeting, and some brief review given of the conclusions of scientific research and of experimental investigation on those subjects which affect them most closely.

“The objects of this Association shall be the advancement of sanitary science and the promotion of organizations and measures for the practical application of public hygiene”—that is the definition of our constitution. An “acknowledged interest in or devotion to sanitary studies and allied sciences, and to the practical application of the same”—that is the qualification for the submission of a name for membership, and that alone.

This, then, is an Association which is not confined either in theory or in practice to the medical profession. And this fact we are glad to take occasion from time to time to bring prominently before the public. Any one is welcome to our ranks who takes any practical and living interest in the grand objects of the prevention of disease and the raising of the standard of the people's health. And this, whether it be by the larger organizations of the nation, the State, and the community, or by the hygiene of the house and the home; that hygiene of the dwelling and of the individual which must be the foundation-stone of all sanitary work, and which is of such paramount importance to the moral and physical well being of the community.

Our meetings are held at different places from year to year, and in this way the Association has already been in touch with a large portion of the continent. Our coming is heralded and our proceedings are fully reported from day to day by the newspapers of the district. Our hope is—and it is a hope amply justified by past experience—that the Association thus enlarges the sphere of its usefulness; that the hands are strengthened and borne up of those who are already fighting the battle for sanitary progress in that neighborhood; and that when the echoes of our deliberations fall on the ears of those who have heretofore neglected these matters, from thoughtlessness rather than from wilfulness, they may be warmed and stimulated into cordial sympathizers and earnest fellow-workers, each head of a family and each individual becoming in a measure a sanitary officer for his immediate home and surroundings, and taking for the future an intelligent interest in the development of sanitary progress and reform in his city, village, or district.

Last year we met in a seacoast city, and quarantine—the prevention of disease from without getting into the country—came prominently under consideration. This year we meet in an inland city, and the health organizations to prevent disease and to deal with the disease that has got in seem naturally to invite the greater attention.

These are the two main strings to the sanitary bow, a system of maritime sanitation at the ports of entry and a system of prevention and preparedness in the interior communities.

Neither is sufficient without the other. The interior communities throughout the length and breadth of the continent have an interest, and a very close and vital interest, in the fittings and working of the quarantine service at the various ports. But confidence in a quarantine system, however perfected, must never be allowed to lull us into a false sense of security, to the neglect of striving ever more and more toward the sanitary improvement of the cities, villages, and districts in which we live.

From the long period of incubation of some of the infectious diseases, and the relative shortness of the voyage from many ports outside the country, and from the possibility of disease lurking in imported clothing and effects, it is evident that unless there could be a routine quarantine detention of all vessels arriving at every port, and a routine disinfection of all clothing and merchandise from abroad, there is always the possibility of exotic disease passing the quarantine barriers in an invisible and unrecognizable stage and condition, and first declaring itself in the interior of the country. This cannot be avoided without such detention of vessels, passengers, and merchandise at the ports of arrival, and such consequent interference with trade and commerce as would be quite unjustifiable and impracticable. Quarantines may be held accountable for dealing with actual cases of infectious disease, with infected vessels and effects, and those suspected of being infected. In this way they strain out and protect the country from a very large percentage indeed of the exotic disease which threatens it from time to time, but they must not be expected to do the impossible, nor must they be leaned on as an excuse for lessened effort inland. Occasional cases of infectious disease in the stage of incubation, and the micro-organisms of disease lurking in unsuspected clothing or merchandise, may pass, from time to time, the most efficient quarantine that is practicably possible. An outbreak may thus occur in some inland locality.

Then at once comes in the value of the national, the State, and the local boards of health, with an organized system of notification and isolation to limit, to confine, and to stamp out the disease.

Coast quarantines and inland health organizations form,

then, our double line of defence, or, to borrow an illustration from the game of cricket, the coast quarantine is the wicket keeper and the health board the long stop.

But it is not only with regard to the relatively infrequent advent of disease from abroad that the results of our inland health work is to be looked for. There are elements of disease, alas ! always with us. And it is in the daily, hourly combat with these that the sanitary worker finds scope for his most earnest efforts.

To the medical men of this vicinity the meeting here of this Association is meant in part as an appeal to quicken your interest in the more purely preventive work of our profession. To increase your interest in the organization and working of the coast quarantines and the health boards by which you are affected, the sewerage of your cities, the disposal of the garbage and refuse, the purity of the water-supply in each of your localities, the infectious diseases of animals now known to be closely related to those of men, and other such broader questions of modern sanitation.

To the non-medical of all ages, sexes, and conditions, it is an appeal to take a lively and practical part in the great crusade against dirt and disease. As in times of invasion every loyal citizen is ready to take up arms in defence of the common liberty, so should every one make war against the common enemy of mankind which comes to attack the health. In the words of Sir Spencer Wells, "Instruct your mayor and corporation, your clergy of all denominations, your own household, that every case of typhoid-fever, of scarlatina, of diphtheria, of small-pox, measles, whooping-cough, can no longer be looked upon as natural, providential, or unavoidable ; but that the existence of such preventable diseases is a proof of ignorance or negligence, and a disgrace to the country, to the town, to the family."

Disregard of the laws of health arises not so much from antagonistic views in relation to proper sanitation, as from our tendency to undervalue the homely little facts and little opportunities of every-day life. As has been well said, "If every individual in a city appreciated the fact that he is to some extent responsible for the condition of the public health, and in order to keep his conscience clear kept his back yard,

cellar, alley, and street clean, the reports of the Commissioner of Public Health would show the result of the multiplied effort."

Every one can do a little, if only to make one home or one room more bright, more cleanly, more wholesome. Sunlight, pure air, and thorough cleanliness are natural enemies of disease germs.

These cannot live where they have not their proper food, which is found in dampness, darkness, mould, and dirt. The experiments of Koch, Ransome, and others prove that the living germs of consumption when exposed to the sunlight lose their vitality in a few hours, or even in a few minutes, if the layer in which they are exposed be thin enough, and that even ordinary daylight if it last long enough will have a similar effect. There is no sounder philosophy than is to be found in the old sayings, "There is more health in a sunbeam than in drugs, more life in pure air than in the physician's skill;" that "sunlight may fade your carpets, but better that than have disease fade your cheeks."

Every one can do a little, if it only be to say the helping word, or do the helping act, toward some sanitary improvement, however small in itself; for, indeed, the aggregate of those little words and little acts may help to increase the health and happiness of your homes and communities more than you may well realize, both directly by their influence on your surroundings, and indirectly by their encouragement of those who are officially charged with your sanitary well-being.

For those gentlemen—unless this be an exceptionally favored community—must often feel how grateful a larger measure of public support would be, and how much a little more sympathy in their work, openly expressed, would cheer and stimulate them to renewed efforts for the public welfare.

Sanitary science is comparatively new, and the prevention of disease as an actuality is not yet fully impressed upon the public mind. There is a vast difference in the popular understanding between the curing of disease and its prevention. The one is actual, visible, comprehensible; the other vague, intangible, and not discernible by any of the senses. Man knows when he is sick, but he is unconscious of approaching disease, and of disease which has been averted, because he

is unaware of the conditions that lead up to and produce his maladies. People are generally quick to tender warmest praise to the physician who has brought them safely through some awful illness, and very rightly. But quite as great skill is habitually being displayed throughout the country in the removal of the causes, and the prevention of the outbreak and spread of disease ; yet how seldom comparatively is this recognized or appreciated.

Do not, then, on the one hand withhold the kindly word of appreciation when occasion offers ; and, on the other hand, as a worker, be not discouraged if much of your best work seems to go unrecognized and unthought of. The greatest, many times the only reward of the sanitarian is to be found in the consciousness of good work well done.

NECROLOGY.

There is a kindly usage, which custom has established, that bids me, amid our pleasant strains of mutual greeting, sound in minor key the sadder note of regretful and feeling remembrance for those of our brotherhood whose faces we may no more hope to see on earth, whose voices will be no more heard among us, who have been taken since our last annual meeting from earthly labor to eternal rest.

Dr. Hosmer Allen Johnson, of Chicago, died at his home in that city on February 26th last. For nearly forty years Dr. Johnson had been actively identified with every forward movement that commended itself to his warm, generous heart and his wide learning. He was President of this Association only two short years ago, presiding over it at the annual meeting in Brooklyn in 1889. He was with us, as most of you will remember, at our meeting last December at Charleston, S. C., and took part in our proceedings with apparently his usual vigorous interest, but he was even then in failing health, which resulted shortly afterward in fatal heart decline.

Surgeon-General Alfred E. Holt, Cambridge, Mass.

Paul H. Kretzschmar, M.D., Brooklyn.

John H. Milhau, M.D., New York.

Richard Gundry, M.D., Spring Grove, Md.

Carl H. Horsch, M.D., Dover, N. H.

Our special committee on necrology will have prepared a fitting record of their lives and services for our public records. Here but little more can be done than to recall their names to your sympathetic remembrance.

ASIATIC CHOLERA.

In the annual report of the Supervising Surgeon-General of the United States Marine Hospital Service, issued since our last meeting, an interesting account is given of extended bacteriological experiments, undertaken by Assistant-Surgeon J. J. Kinyoun, to ascertain whether there was an antagonism between the venom of the cobra and the poisons produced by the spirillum of Asiatic cholera, Mr. F. A. Perroux, of Calcutta, having reported that certain tribes in India use the cobra venom as a curative inoculation for cholera, the worst cases being stated to have been cured even when circulation had all but ceased.

Dr. Kinyoun carried out a careful series of experiments, both with regard to the germicidal action of the cobra venom upon the cholera spirillum in the different nutrient culture media and also after inoculation into rabbits. He came as a result to the following conclusions :

1. Cobra venom is germicidal to the cholera spirillum in a three quarter of one per cent solution.
2. There is no antagonism between cobra venom and the poison of the spirillum of cholera.
3. It will not prevent the coagulation of blood.
4. When the two poisons are administered together, or the cholera poison followed by the cobra venom, the toxic effects of cholera are intensified.

Attention has recently again been directed to the observations made by Dr. A. Harkin, of Belfast, in 1884. That observer dwells upon the physiological effects of the relations between the vagus and the sympathetic, and recommends the application of blistering fluid behind the right ear with the idea of stimulating the vagus nerve so as to inhibit the action of the sympathetic on the abdomen. At the instance of the Secretary of State for India, the Government of India has forwarded this year to all their local governments and adminis-

trations copies of pamphlets, entitled "The Vagus Treatment of Cholera," with a request that the mode of treatment therein recommended may be tested in selected hospitals.

LA GRIPPE.

The recurrence of the epidemic or pandemic, as it may almost be called, of grippe this year, has led to many investigations with the view of discovering its causal micro-organism. The result has not as yet apparently proved successful, although Babès has recently isolated two micro-organisms to which he thinks that in all probability the pathological element in the causation of influenza may be attributed. We have advanced but little if at all from the hypotheses of last year. If we are to believe that the disease is caused by septic micro-organisms from the buccal or respiratory mucous membranes, we may suppose either that one or more of these acquire a greater virulence under the influence of meteorological conditions, which affect each invaded district successively, or that these same atmospheric modifications when they occur lower the system to a degree that allows it to suffer from micro-organisms previously inoffensive. Certainly the simultaneous occurrence of such large numbers of cases, as have been reported in various cities on the first day of its invasion, differs markedly from the usual spread of disease from centres of infection. If, then, the disease is to be accepted as microbic, as we must from analogy doubt the possibility of the conveyance through the air for long distances of swarms of active micro-organisms, one of the above hypotheses of auto-infection under peculiar atmospheric conditions would seem to be what we are reduced to, pending further investigation.

Dr. Parsons, however, of the Local Government Board, and Dr. Sisley, in recent reports, claim that no unquestionable instance is recorded of the epidemic having commenced suddenly with a large number of simultaneous cases in a place previously free from the disease. They state that isolated cases have always preceded the epidemic outbreak. The first droppings of a thunder-shower point to a coming storm. The first cases of influenza point to an impending epidemic, but they do more, they produce it by contagion. Parsons and

Sisley believe that it is propagated mainly or almost entirely by human intercourse, and that the rapidity of spread is accounted for by the short period of incubation it undoubtedly possesses.

CANCER.

The relations which coccidiæ or psorosperms bear to innocent and malignant tumors are as yet undecided. Both Pfeiffer and Babès have described bodies of this nature, which they have seen in cancers, and subsequently Darier, Wickham, and others demonstrated their existence in Paget's disease and in various forms of cancer; but the question must still be considered an open one, as to which no dogmatic statement is as yet possible.

Russell's fuchsine bodies have generally been found in cancerous growths by observers throughout the year. Edington claims that they are a form of hyaline degeneration occurring in certain specific inflammations in tubercle, rhinoseleroma, etc., and also in certain new growths, more particularly in those that are somewhat rapid in their development, and that they have no relation whatever with fungi. And Shattock and Ballance regard them as either platelets or red disks which have undergone hyaline necrosis.

Numerous experiments have been made during this year for the relief or cure of inoperative malignant growths, by the parenchymatous injections of methyl-violet, the pyoktanin of Stilling, so strongly recommended by Von Mosetig. Bearing in mind the affinity which the nuclei exhibit for aniline dyes, the idea is that if these nuclei of the cells of the neoplasm could be destroyed, its development would be checked. To this end Von Mosetig, as far back as 1883, tried the injection of trichlorate of aniline. This, on account of its disagreeable secondary effects, has recently been replaced by the pyoktanin.

TUBERCULOSIS.

At the time of our last annual meeting the excitement over the introduction of Koch's lymph for the cure of tuberculosis was at its height. All too quickly, however, after this "period of

enthusiasm," came the "period of disbelief," heralded by the warning notes sounded by Virchow from fear of the freed bacilli seeking lodgment elsewhere, and by Liebman of Trieste, who found them in the blood from the fingers of patients under treatment, and confirmed by the general failure to find in tuberculin a successful curative agent.

In the early part of the year Liebreich proposed the use, in a similar way, of the active principle of the Spanish fly, administered as the cantharidinate of potash, his theory being that the remedy would cause transudation of blood serum at the affected part, and that this would act beneficially both by nourishing the cells, so as to bring back to their normal condition badly nourished ones, and also by the disinfecting and germicide action of the serum upon the bacilli themselves.

Following Weigert's endeavor to destroy the bacilli in the lung by the inhalation of superheated air, Germain Sée introduced another treatment of tuberculosis by the continued inhalation of medicated air under pressure, the drugs used being creosote and eucalyptol.

Then, as a sequence of the investigations into the germicide action of blood serum, and especially of those recent researches which show that the serum of naturally immune animals can be used to confer insusceptibility to a disease, came the injection, as a remedy for tuberculosis, of goat's blood by Bernheim, Picq and Bertin, and Lepine, and the injection of the blood serum of the dog by Hericourt and Charles Richet, Saint Hilaire and Coupard, on the supposition that those animals were immune to the disease—a supposition which more recent researches by Chantemesse, Beucler, and Colin seem, however, to disprove.

That this country has not been behind hand in this matter is witnessed by, among others, the advocacy of the subcutaneous injection of gold and manganese by Dr. John Blake White, and that of vaccine lymph by Dr. J. Hilyard Tyndale.

More recently has come the presentation by M. Lannelongue, before the Académie de Médecine, of what he calls a method of prompt transformation of tuberculous products in the joints and certain other parts of the human body, by deep local injections of weak solutions of chloride of zinc outside of and around the spreading edge of the tuberculous tissues.

And at the second Congress for the Study of Tuberculosis, held in Paris in August now last past, the subcutaneous injection of guaiacol in sterilized oil of sweet almonds was advocated by Diamantberger and Weil, while Picot upheld his method of the injection of guaiacol and iodoform in sterilized oil and liquid vaseline.

Whatever may be the ultimate verdict upon the curative values of these various means of treatment, their introduction and study have led to marked advantage in several directions. The study of substances which have thus, for the first time, been found to directly and specifically affect tuberculous matter within the living body, opens up a wide field of medical activity by which not only tuberculosis but many other diseases may possibly be prevented or cured. Then the employment of tuberculin has made us familiar with the action of the chemical products of the bacillus tuberculosis upon man, and has stimulated the researches which during the last few years are becoming less and less directed to the micro-organisms themselves, and more and more to the chemical investigation of the albumoses, ptomaines, tox-albumens, etc., which are the products of their life history.

And from the free discussion of these remedies throughout the secular press at least this marked benefit has arisen: that the general public must have become widely and intimately acquainted with our belief that tuberculosis is an infectious disease; that man belongs to a readily susceptible species; that the bacilli are the cause, and that the dried expectoration especially conveys and spreads the infection. When it is remembered that from one seventh to one fifth of all human deaths are stated to be from tuberculosis in some form; that we are told by Dr. Billings that, in the United States alone, there are 500,000 or 600,000 persons suffering from consumption, the importance is readily appreciated of the general diffusion of such knowledge as will reconcile the public to the enforcement of measures to control and limit its spread.

As recent instances of such measures, well worthy of general imitation and adoption under similar circumstances, the following may be mentioned: As a measure of precaution against the dangers to which Berlin was exposed last winter through the influx of tuberculous visitors, the police authori-

ties, acting in concert with the municipality, issued an order by which all cases of tuberculosis of whatever kind occurring in hotels, boarding-houses, furnished lodgings, private sanitarium, etc., were to be classed among the infectious diseases, the heads of such establishments were obliged to take the usual precautions as to disinfection, and medical practitioners were obliged to give notice of such cases to the board of health within twenty-four hours.

Again, the disinfection of railway cars is receiving the attention of foreign railway companies. Practical action in similar direction would not be amiss in this country. Owing to the tenacity of disease germs, it is wholly unknown how much they are disseminated by our luxuriously upholstered sleepers and coaches. Certainly, as it has been well pointed out by a writer on this subject, it would be difficult to conceive of a conjunction of circumstances more thoroughly well adapted for the spread of consumption than is offered by the sleeping car. Overcrowded, ill ventilated for fear of draughts, and with the temperature raised to a degree sufficient to rapidly dry and disseminate infectious matter, now, if it has been recently occupied by a consumptive patient—perhaps only *en route* for a change of climate—and if through any cause tuberculous sputa come to be deposited on any part of the car, what becomes of this if it be not dried and spread through the car and gradually into the lungs of the tired traveller?

In France they discard the velvet cushions and heavy drapery in the cars running to the southern districts, when travel is heavy among passengers afflicted with pulmonary complaints, and have adopted instead soft leather coverings. The bed clothing is thoroughly disinfected, and mattresses are covered with impervious silk or with gutta percha.

Moreover, from these free discussions the fact has become more generally known that the danger of the infection of consumption comes chiefly from the expectorations. These dry on linen, on bedclothes, on pocket-handkerchiefs, in spittoons, on the floors of houses, the pavements of the streets, etc., are reduced to powder, suspended in the air, and thus breathed into the lungs—a practical outcome of this knowledge being the more general adoption of spittoons and spit-cups containing liquids. All vessels so used should be disinfected by boil-

ing water, or better, steam, after the fluid contents have been cast into a fire.

The increased and increasing attention to the possibility of the spread of the disease by the use of tubercular meat or milk is another valuable outcome of increasing secular knowledge on this subject, and a check is now kept, or should be kept, by the inspectors of our cattle and of our meat and milk supplies in all our large towns. The boiling, or heating to nearly boiling, of the milk, and the thorough cooking of the meat are precautions that are daily becoming more generally recognized and adopted.

One very marked advance during this year in regard to tuberculosis has been the putting into operation in the United States of the new immigration law which came into force on the 1st of April last. By this new law consumption is classed as a "dangerous and contagious disease," barring admission to the country. Immigrants now suffering from it are ordered to be returned to the ports from whence they came.

DIPHTHERIA.

There are few infectious diseases upon which more light has been thrown by the study of their specific micro-organisms than has been the case with diphtheria. Since the important contributions of Löffler and of Roux and Yersin last year, we have Klein's recent continued researches on those ailments of milch cows which have from time to time been discovered in association with epidemics of milk diphtheria; the investigations of the toxic albumens produced in cultures of this bacillus by Frankel and Brieger; the experimental production of immunity by Frankel and by Behring, and the observations as to the etiology of the disease by Welch and Abbott of the Johns Hopkins. These last observers conclude in favor of the doctrine that diphtheria is primarily a local disease, and that the grave constitutional symptoms are the result of intoxication with poisonous products formed by the local action of the bacilli; and they dwell on the great practical value for diagnostic purposes of a bacteriological examination, by cover glass preparations and by cultures, in this large group of cases often so puzzling to the practitioner.

Most interesting papers on this disease were read before the recent International Congress by two of our members, Dr. Hewitt, of Minnesota, and Dr. Abbott, of Massachusetts. I trust that we are to have the privilege of hearing from one or both of these gentlemen on this subject during our present meeting.

BACILLARY PARTNERSHIPS.

In the series of observations herein referred to Welch and Abbott noted that the faithful attendants of the Klebs-Löffler bacillus, the streptococci, were present also in the same situations.

Vaillard and Vincent, in their paper published in January last on tetanus, show that the tetanus bacillus cannot grow in the human body or develop its poisonous products without the presence of another micro-organism, the disease being therefore in a sense one of mixed infection. Cornil and Babès point out that a certain affinity exists between particular species of micro-organisms.

In other words, the development of special varieties may be facilitated or the reverse by the presence or pre-existence of certain other varieties. In this way the occasional complication of an existing infectious disease by a second is not the result of mere chance, but is governed by some still undefined conditions of environment. In other instances this association of two or more species of micro-organisms is necessary to the evolution of the malady. This association is the rule in the infectious diseases of human beings, and it is often the secondary infection that determines the fatal issue. This partnership arrangement may take place between micro-organisms belonging to more or less nearly related species, as is the case with the organisms of pneumonia and enteric-fever, or there may be streptococci and bacilli together, as in diphtheria, or several varieties of streptococci, as in the infection of wounds.

These facts may possibly throw some light on the rhythm and sequence of symptoms in the infectious diseases.

And as an indication for treatment, when we thus know that, to cite only one example, the gravity of scarlet-fever is

in direct relation with the presence of the bacteria of pus, we are confirmed in employing the most rigorous conditions of antiseptis, especially applied to the region of the mouth and throat.

DISINFECTION.

In a discussion before the Society of Medical Officers of Health of England in February last, Wynter Blyth dwelt on the value of the recent researches of Behring and Pfuhl upon the efficacy of lime as a disinfectant. Boer has also shown that, while the addition of very small quantities of lime to a culture fluid greatly favored the development of bacteria, larger quantities, or the equivalents of potash and soda, were speedily fatal to all pathogenic organisms in any other form than the spore. Thus the strongly alkaline soft soap was a far better germicide than carbolic or thymol soap, and the lime washing of walls and ceilings with scrubbing of the floor and wood-work with soft soap was generally sufficient for the disinfection of a room. We will all, I think, be ready to endorse Wynter Blyth's remark, that since we, as medical officers, must so often select the cheaper forms of disinfectants to use on a large scale, it is indeed satisfactory that the most recent researches confirm our belief that lime and alkaline soap must be exalted from the humble position of mere cleansing agencies to their proper position of true disinfectants.

Von Esmarch also has recently enumerated some of the points that should be specially attended to in the use of disinfection by steam.

These observations all confirm the conclusions and recommendations of the Committee on Disinfectants of this Association.

Their classical report on Disinfection and Disinfectants remains the standard text-book on those subjects so indispensable to every sanitarian.

Yet it is very expedient that the present position of disinfection should be dwelt on and reviewed from time to time. As the *British Medical Journal* says, "It may be said that these are all truisms, but they are truisms that are constantly being forgotten, especially by men whose experience is not very extensive."

IMMUNITY.

Researches have been continued since we last met, carrying on the interesting experiments showing that the blood serum of naturally immune animals and also of animals rendered artificially immune can be used to confer insusceptibility to a disease.

Behring and Kitasato at the end of last year found that the serum of a diphtheria immune rabbit exerts no bactericidal action on the diphtheria bacillus, but that it possesses the remarkable power of destroying the poison produced by this micro-organism.

One of the most interesting discussions at the August meeting in London of the International Congress of Hygiene was that on the subject of immunity.

Metschnikoff championed his theory of the phagocytic action of the leucocytes with their positive or negative chemiotaxis. He was ably supported therein by Roux.

Buchner tended rather to the theory that immunity is induced by some action of the blood, apparently independent of the amœboid cells.

Emmerich held that the cause of artificial immunity resides in an antibacterial but, as far as the body cells are concerned, innocent toxin. This matter, inimical to bacteria, can be introduced into the body by vaccination, but it is also possible that the same substance may be formed from the body cells themselves by the stimulus of an invasion of bacteria.

Behring claimed that the bactericidal properties of the living organism are to be found in the blood serum deprived of all cells.

And Hankin submitted a new theory of immunity, which he stated as follows: "Immunity, whether natural or acquired, is due to the presence of substances which are formed by the metabolism of the animals rather than by that of the microbe, and which have the power of destroying either the microbe against which immunity is possessed or the products on which their pathogenic action depends."

To these substances—to which he considers the bacteria killing power of the blood serum is due—he has given the name of "defensive proteids," the "alexines of Buchner."

And Hankin points out that while, when first the bactericidal action of blood serum was worked out, it was supposed that a serious blow had been struck at the theory of phagocytosis, the discovery of defensive proteids shows that this is by no means necessarily the case. He first obtained defensive proteids from the spleen and lymphatic glands of various animals—that is to say, they were obtained from cells which are potentially phagocytes. It is possible that they are the weapons used by phagocytes in their conflict with the micro-organisms, and that only after the death of the cells do these substances find their way into the blood serum.

In this connection I may briefly remind you of the researches of Behring and Frankel on acquired immunity in diphtheria, of Kitasato in tetanus, of Hankin, Ogata, and Jasuhwara and Wooldbridge in anthrax, and of Vassale and Montanari and G. and F. Klemperer in pneumonia.

The recent endeavors to bring the results of such experiences as these to bear upon the treatment of tuberculosis I have already referred to.

Ashmead of New York has been carrying out a series of experiments based on the alleged immunity of the Japanese to scarlet-fever. He has been endeavoring by the inoculation of an immune Japanese with scarlet-fever germs to obtain a modified lymph to prevent scarlet-fever in the Caucasian.

These most interesting lines of research open up new possibilities which promise to lead to results of the very highest scientific and practical value.

This can be but a hurried and very incomplete retrospect, and that only touching one of the many sides of the subject. To attempt the full story of the progress of sanitary science during the past year would carry me far beyond such bounds as I have had to place upon myself. There are earnest workers in every quarter of the globe devoting highly gifted and well-trained intelligences to the lessening of human illness and the saving of human life. If we need any fresh incentive to our labors, we have but to compare the death-roll of the past with that diminished mortality which has gone hand in hand with the scientific application of the principles of sanitary medicine to the circumstances in which we live.

Such studies as I have referred to thus briefly bring us nearer every day to the actual causes of infectious diseases, and with such knowledge a means of prevention or cure can only be a matter of time. And, as has been well said, when we look at these recent advances in our knowledge of the intimate nature of infection, and of the still hidden yet far-reaching influence of disease, we are further stimulated to push ever onward, in friendly rivalry with those upon whom the laurels of the past have so deservedly been bestowed.

ABSTRACT OF THE PROCEEDINGS OF THE NINETEENTH ANNUAL MEETING, HELD AT KANSAS CITY, MO., OCTOBER 20TH-23D, 1891.

Following the usual formalities at the opening of the first session, on Tuesday morning, at 10.30 o'clock, by the president, Dr. Frederick Montizambert, of Quebec, the first paper read was on the

CAUSES AND PREVENTION OF INFANT MORTALITY, by C. D. McDonald, M.D., of Kansas City. He attributed the excessive sickness and mortality during infancy to the lack of proper nursing care by mothers, too frequent bathing, too low a temperature in the nursery, the use of improper food, neglect of proper clothing, and the want of promptitude in calling for treatment at the beginning of illness. With regard to artificial foods, he declared himself opposed to all of them; that if mother nature intended anything better than milk to nourish the babe, she would have put it in the mother's breasts. That gruels, barley waters, corn starch, and beef teas—no starchy substance—can be digested by the young babe. As soon as nature makes preparations for the digestion of starchy substances she will give the babe teeth to chew the bread.

The subject was discussed by Dr Harvey Reed, of Ohio, Professor W. W. Daniells, of Madison, Wis., and Dr. Joseph Sharp, of Kansas City. Dr. Reed declared that he had been struck on coming through Missouri with the great number of dirty ponds to which cows had access. He attributed a frequent cause of unwholesome milk to the use of dirty water of this kind by milch cows, as well as by dishonest milkmen.

GLANDERS IN MAN, WITH THE REPORT OF A CASE, by

Joseph Sharp, M.D., Professor of Materia Medica and Therapeutics, in Kansas City Medical College, was the next paper. The special feature of the paper was the report of a case which occurred in his practice, and in which he pointed out the difficulty of diagnosis. He gave an outline of the methods of microscopic examination together with the best methods of cultivating the bacilli of glanders. He recommended that for preventing glanders, persons who came in contact with horses having open sores or discharges from the nose should disinfect the hand with a solution containing a tablespoonful of equal parts of glycerine and carbolic acid in a quart of hot water, or ten grains of corrosive sublimate in a quart of water. The disease in the case reported was contracted by the inoculation of a sore on the hand while the subject of it was handling a horse afflicted with the disease. Professor Sharp classed glanders with acute infectious diseases, such as tuberculosis.

Dr. Paul Paquin, Director of Laboratory of Hygiene, at Battle Creek, Mich., in discussing this paper, told of a collection of seventeen cases of glanders in man which he had collected in the State of Missouri. As an instance of the virulence of the poison, Dr. Paquin told of one man who, driving behind an affected horse, was struck in the eye by a spray from the beast's nostrils; a case of glanders developed rapidly, and ended in the man's death.

THE NECESSITY OF MORE STRINGENT LEGISLATION TO REPRESS EMPIRICISM, by Hon. Albert H. Horton, Chief Justice of Kansas, Topeka, Kan., was a forcible paper, from a medico-legal point of view, against the toleration of incompetent medical practitioners and quackery.

"The mountebank of the nineteenth century," he said, "with brazen face and clarion voice, travels the length and breadth of the land proclaiming himself as 'Diamond Dick,' 'Indian Bill,' 'Big Chief,' or by some other equally euphonious and ambiguous title as he asserts his skill and disposes of his wares. It might not be justifiable homicide to compel him to swallow his own darksome nostrums, but the present laws are insufficient for his repression, and however beside himself he may become, we can hardly hope that he will so far forget his villainy as to administer unto himself that which he so recklessly deals out to others."

Of the legitimate practitioner of medicine Judge Horton was eloquent in praise. And he thought that this association should recommend the enactment of laws that would exclude from the medical profession all incompetents. That nobody, in his judgment, should be permitted to practise medicine or surgery unless authorized by a board of government or state examiners.

Several members expressed hearty approval of Judge Horton's paper, and a resolution was offered proposing such action by the association as he recommended.

WATER SUPPLY AND PUBLIC HEALTH was the subject of a paper by Allen Hazen, C.E., of Lawrence, Mass., which showed the relation of impure water to disease germs, and the importance of protecting inland water-courses and supplies from all sources of impurity.

VITAL STATISTICS was the subject of the next paper, by Dr. H. B. Horlbeck, Health Officer of Charleston, S. C., showing the excessive death-rate of the colored race South as compared with that of the white race. After which the session adjourned.

The evening session of the first day was devoted to addresses of welcome by the civil authorities and the President.

Governor FRANCIS, of Missouri, said, in substance :

"An association which sprang from a desire to benefit humanity, and has for twenty years been maintained by scientific philanthropists for the purpose of checking disease, alleviating suffering, and promoting sanitation, is worthy the support of all good citizens, and challenges the admiration of thinking men the world over. The American Public Health Association honors Missouri by its presence ; and I am here in my official capacity as chief executive of this commonwealth not only to greet you with that warmth of welcome that characterizes Western hospitality, but to manifest and emphasize by act and word the deep interest our people feel in the laudable work in which you are engaged.

"The march of civilization is being constantly marked by new discoveries in science, and by practical application their value is tested. We live much more than our forefathers did. Better a decade of this age than half a century in the darkness of the Middle Ages. In our three score years and ten we live

longer than did Methuselah through all his centuries ; but our life is none the less precious. Rather do we cling to it the more tenaciously. Its increased advantages bring multiplied opportunities and additional obligations. Economic and social problems have become political issues. The age is intensely practical, but is constantly growing less selfish. A broader humanity is daily taking deeper root in the hearts of men. We of America, having driven back the savage, cleared the forest, defined our possessions, and assumed our position among the nations of the earth, can turn our attention to the development of our resources, but cannot afford to overlook the social and sanitary condition of our people if we would maintain that eminence and power which we have attained. The Church recognizes that its offices must not be confined to directing its votaries to mere professions of belief ; men will no longer be reconciled to the afflictions, hardships, inequalities, and oppression of life by promises of equality and happiness in eternity. Church and State and society, enlightened, progressive, philanthropic, and practical, are all working to a common end—the elevation of man. The Church, while not losing sight of his spiritual welfare, is endeavoring to help him to a better social order now and here ; the State, while protecting life and property, is extending its authority to the aid of the weak by enforcing recognition of the rights of humanity, in order that oppression, and defiance, and desperation may not eventuate in the downfall of the governmental fabric and the reign of anarchy. Society, or civilization, or progress, imbued with moral convictions and impelled by practical ideas, is in the van of both Church and State battling against superstition and indifference for the betterment of the moral, intellectual, and physical condition of man.

“ You who have assembled here for the purpose of giving to each other and to the world the results of your labor and research for better sanitation and the prevention of disease, are leaders in the great contest, and the State and humanity acknowledge obligation to you for scientific applications and discoveries.

“ There is a class of citizens, of eminent respectability it may be, as they are not pensioners, and do not oppress or transgress on the rights of their fellows, and bear their share

of the public burdens in the shape of taxes that they cannot evade, but who consider their entire duty done when that much is accomplished. A community of such men would be an association of drones; a State composed of such citizens would lapse into barbarism. They are found in every city, town, and hamlet, but happily they are in the minority in this age and locality. They enjoy and accept with an air of meritorious proprietorship the 'unearned increment' that results from the toil and enterprise of others, whom they, in their professing conservatism, call speculative, ambitious, reckless. They have not the acumen to appreciate the value of an intelligent public spirit, their souls are too narrow to be moved by benevolent impulses, and their selfishness too absorbing to admit of beneficent acts. They live out the lease of life allotted them, their departure creates no void in the community, they pass away unwept and unhonored, and the world is no better for their having lived. Such men fail to comprehend the benefit of your work, and may look upon your efforts as valueless theories; but the observing student of history and the far-seeing, practical man of affairs can see the beneficent results of your discoveries in every civilized country on the globe.

"In addition to its moral grandeur, this sanitary work has a material value almost incomprehensible, and certainly incalculable. If labor is the basis of all value, every human life must possess its proportionate worth. The great falling off in the death-rate and the decided decrease in epidemics are attributable to the better sanitary regulations, adopted after urgent solicitations from yourselves and your scientific colleagues or predecessors. The prevention of epidemics can best be appreciated by a community that has been visited by one. The loss is inestimable. Immigration ceases, capital is alarmed, and improvements are unknown. Time—and a long period of time—is required to restore confidence and quiet fear of a recurrence. But it is not necessary to demonstrate or recall the importance of your mission. Look at the individual estimate of life. Every rational being makes it second to honor alone. The State has wisely and rightfully assumed the authority to enact sanitary regulations and enforce their observance. The true province of government is not tran-

scended, nor is the liberty of the citizen violated when all are required to obey laws which conduce to the promotion of public health. The city or the State which adopt and enforces with firmness and impartiality the strictest sanitary regulations not only enhances its material interests, but adds a charm to the attractions of home and inspires its children with a more devoted patriotism.

“Gentlemen of the American Public Health Association, scientists and philanthropists, who have assembled here in this great Missouri Valley in the pursuit of your high calling, Missouri recognizes in you representatives of the most advanced thought of the times and the highest type of citizenship, and salutes you as public benefactors. May your deliberations prove so abundantly successful as to inspire you with renewed zeal and redoubled efficiency in the noble work in which you are engaged.”

After the applause that followed Governor Francis's excellent address had died away, Governor HUMPHREY, of Kansas, was introduced. He said that while he could add very little to the words spoken by Governor Francis, he was glad to have the opportunity to meet the association, and on behalf of Kansas extended to the visitors from far-away places a cordial welcome and a hearty greeting to this section of a glorious country.

“I suppose,” he said, “the most difficult work this body has to do is to educate the public, and I believe it will be no extravagance for me to say that your organization is a patriotic one. One of the first provisions of the Constitution of our country is for the promotion of the general welfare of the people, and, as I understand it, that is what you are trying to do. Therefore I say you are patriotic. It is absolutely unselfish patriotism. The question of sanitation will always be an important one; and I am sorry to say the legislatures of my own State have been too indifferent to its importance. Not being familiar with your association or any of the topics to be discussed, I will not attempt to say anything on a subject of which I know so little. My own ignorance of the work, however, is a moral that plainly points out the necessity of the organization.

“I hope that when you go away from your deliberations you will carry with you pleasant remembrances of your visit

to this great and growing city and the hospitality of her people."

Following Governor Humphrey, Councilman JOHN L. PEAK spoke in behalf of Mayor Holmes, of Kansas City, who was unable to attend the convention. He eloquently welcomed the visitors, and told of the wonders of Kansas City and her future glowing prospects.

Next followed the annual address of the president, Dr. Frederic Montizambert, published *in extenso* on other pages.

The second day, morning session, the first paper read was

VACCINE AND VACCINATION, by Paul Paquin, M.D., D.V.S., Director Laboratory of Hygiene, Battle Creek, Mich. He graded virus as absolutely pure, fairly pure and dangerous, cystic or very dangerous, as the result of elaborate microscopic investigation, and urged the necessity of that which is absolutely pure. He had made examinations of over one hundred specimens of virus, taken from some twenty different sources, and fully believed that all the irregularities in the results of vaccination arose from the employment of impure lymph. In the discussion that followed, Drs. Hewitt, of Minnesota, and Salomon, of Louisiana, favored the use of bovine virus. They had seen it extensively used, and had experienced no bad results when proper care was exercised in the preparation and employment of the virus.

Dr. Ycaza, of Mexico, on the contrary, maintained the use of humanized lymph. He said that in Mexico it had been found by experience that humanized virus is far preferable. The whole question of the collection and culture of the virus and the employment of it is under the direct control of the general government. There are doctors whose entire time is devoted to the collection of lymph and vaccination.

Children are required to present themselves at stated periods for vaccination. The healthiest subjects are alone chosen for the culture of the virus, and the result has been to drive small-pox epidemics from the land. He thought that everything depends upon the intelligent method employed by the physician in collecting it, and felt satisfied that its proper handling would cause no trouble to the patient whatever.

DRAINAGE OF MEXICO CITY, by Roberto Gayol, C.E., City Engineer, and Engineer of the National Board of Health of

Mexico, was the next paper. Preparatory to reading his paper, he had distributed to the members present maps and diagrams illustrating the topography of the City of Mexico and its surroundings, and the proposed location of the sewer mains.

The City of Mexico, he said, is situated at the bottom of the valley of the same name, enclosed by mountains, which are of great altitude on the eastern, southern, and western sides, but on the north there is a great depression, which only rises 250 feet above the city.

This valley contains three natural lakes, Chalco, Xochinnilco, and Texcoco, and three artificial lakes, San Cristobal, Xaltocan, and Zumpango.

Lake Texcoco is the lowest and most extensive lake, and receives the refuse of the city. Its waters are strongly impregnated with salts—chiefly carbonate of soda—and these keep the waters healthy, though for several centuries the lake has received the refuse of hundreds of thousands of people.

The bottom of the lake has risen by these accretions until now its bottom is but six feet below the mean city level. This difference of level was the only means of giving current to the city's sewage, and its decrease often causes a general inundation.

To remedy these evils, the main drainage works were projected many years ago. This project includes a canal thirty miles and a tunnel six miles in length, draining the lake.

The paper was very complete in detail, showed thorough familiarity with the subject, and it well merited the close attention of the audience which it attracted.

DISPOSAL OF WASTE AND GARBAGE.—Professor Delos Fall, of Albion, Mich., chairman of committee on the subject, reported progress. The result of a number of inquiries directed to the secretaries of the boards of health of a number of cities showed a vexed state of affairs to exist pretty much all round, dumps prevailing in inland cities and immersion in the sea and lakes being followed on water front cities.

In submitting the several contributions to the report, he expressed some embarrassment of the committee by the contending projectors and proprietors of various crematories and other plans that had been devised ; but he thought some compromise on or combination of the excellences of each may be

devised superior to any. The committee had not as yet completed its labors ; but its progress was shown by the contributions of its members, as follows :

1. Proposed Forms of Ordinances (read by title).
2. Collection and Transportation of Garbage and Refuse in Cities, Edward Clark, M.D., Buffalo, N. Y.
3. Tabulated Reports of Health Officers (read by title).
4. Methods of Disposal : (a) The Merz or Vienna System Described, Edward Clark, M.D., Buffalo, N. Y.
(b) The Rider Garbage Furnace Described, Crosby Gray, Pittsburg, Pa. (Read by title.)
(c) " The Engle System " Described, Colonel W. F. Morse, New York City.
(d) Crematories used in England Described, Randolph Hering, C.E., New York City. Read by Crosby Gray, Pittsburg, Pa.

Dr. Clark pointed out the evils incident to allowing refuse matter to be left long to " smell to heaven," and attributed much of the complaint about the present methods of handling garbage to the use of improper wagons. The public naturally objects to disagreeable sights, and there is no question about most of the wagons used for such purposes being unsightly. In Buffalo, the speaker's home, the carts are kept clean and the garbage closely covered. One reason Dr. Clark advanced why garbage was such a nuisance was because it was allowed to be dumped on the premises, and there left until badly decomposed. He advocated that in the business portion of the city all garbage should be removed every day, and in the residence portion two or three times per week. Such removal should only be made at night or in the early morning, before people are astir.

Colonel Morse, of New York, vigorously opposed the contract system of disposing of garbage, arguing that it was never a satisfactory service, and resulted in unclean alleys and unhealthful sink holes in the city. He favored the cities doing their own work as the only way efficient service could be secured. The item of expense was greater, perhaps, but the men and teams could be employed to advantage on other public work, and thus overcome all such objections. Garbage, he thought, should be subject to rules and regula-

tions and measured for disposal. He described how carts can be unloaded without exposing their contents to a sensitive public. In our cities the expenditures for maintaining the public health are disgracefully small, and this question, with all its importance, receives practically no assistance or attention.

Mr. Herring, in his paper, read by Dr. Crosby Gray, of Pittsburg, Pa., described the system used in England in detail, and extolled it as being the best he had seen. It possesses the peculiar advantage of allowing the city to realize on garbage, and not only disposes of all refuse matter satisfactorily, but enables a revenue to be derived as well.

At the evening session the first paper read was on

RABIES, by J. J. Kinyonn, Passed Assistant Surgeon, U. S. Marine Hospital Service. He said the disease is almost wholly confined to the canine and feline species of animals. That it prevails all over the world, except in Australia, where it is not known. He regretted that so little is known of its prevalence and that so little report is made. The best source of information seems to be the public press. He opposed the idea that the disease is confined to warm weather, the statistics showing that the greater number of cases occur in December and May. The disease rarely appears later than six months after inoculation. He discussed Pasteur's system and its success. Saliva becomes virulent two or three days before any symptoms appear. Recognition of the disease is not easy in any animal in the early stages. He advocated the establishment and enforcement of strict quarantine regulations in order to prevent, and, if possible, eradicate this terrible disease.

AMERICAN CLIMATES AND THEIR PHYSICAL EFFECTS, by P. C. Remondino, M.D., of San Diego, Cal., will appear *in extenso* in our January number.

ANIMAL DISEASES, by Ernest L. Dundas, V.S., U. S. Veterinary Inspector, Kansas City, Kan., was a strong protest against sending diseased cattle to market. Dr. Dundas alleged that, as a common practice, as soon as a farmer discovers that tuberculosis is about to ravage his cows, he immediately ships them off to market to get rid of them before they die on his hands. He also urged police supervision of all milk

dairies. He laid to the Jersey cow the blame of being most generally afflicted with tuberculosis.

In the discussion which followed, Dr. Green, of Buffalo, said that, while it might not be incorrect that the disease was quite common, and deserved close watching, still the fact should only urge the medical practitioner to more earnestly fight against the spread of the disease among his human patients.

Dr. P. H. Brice, of Toronto, said that no milch cow should ever be "bred," as it was a granted fact that tuberculosis was attributable to breeding. In Canada we never breed our milch cows; and in one city of great importance we never use a milch cow after she once goes dry; she is immediately sent to the butcher. The great question before us now is how to designate a cow when she is so afflicted. It seems to me that in view of the startling figures that there are 15,000,000 cows daily supplying this country with milk, and the fact that in certain abattoirs it has been shown that five to ten per cent of the cattle killed are tuberculous, there should be a most rigid and regular inspection of all milch cows for the protection of the public health.

Dr. Salomon, of New Orleans, inquired of Dr. Dundas the method adopted by the Government in the inspection of meat, and asked how they arrived at a conclusion whether or not a beef was diseased by tuberculosis. Dr. Dundas answered that the Government required him and all its inspectors to keep the mode and details of the inspection a secret, but if the gentlemen present wished to witness an inspection, he would be glad to show them how it was done, if they would visit the packing houses.

NEW ORGANIZATION OF THE SUPREME BOARD OF HEALTH OF THE MEXICAN REPUBLIC, by Dr. Domingo Orvananos, Member of the Supreme Board of Health of Mexico, was read. And, as described in this paper, the Mexican Supreme Board of Health is evidently a most complete system of supervision; a system which on its face would tend to make it one of the most thorough in operation in any country. One exceedingly good feature of the code is the sending with every ship leaving Mexican ports a medical officer, who shall be held responsible for the sanitary condition of the vessel, and who shall be obliged to report to the Mexican consul at every port where

the vessel may touch, and obtain from him a clean bill of health. This move, the doctor added, was done in view of the fact that Mexico is preparing to meet the reciprocal treaties of all countries, thus calling for an extensive maritime service.

LAND LIBERATION AS A PUBLIC HEALTH MEASURE, by George Homan, M.D., St. Louis, Mo., was the concluding paper of the session. Its purpose was to show the benefits which would arise by the individual ownership of homes, as that would render less likely any communicable disease, as well as render the fight easier against disease by admitting of isolation, a most desirable feature in all efforts for the protection of the public health.

The third day—morning session.—The first paper read was on THE PRESENT POSITION OF THE MILK-SUPPLY PROBLEM, FROM THE PUBLIC HEALTH STANDPOINT, AND SOME PRACTICAL METHODS FOR SECURING SAFE PUBLIC SUPPLIES, by Peter H. Bryce, M.D., of Toronto, Ont. It was very comprehensive and of much practical utility. There were, the author said, over 15,000,000 milch cows in the United States, and each cow produced about 100 gallons of milk during the year. Only five per cent of this supply is used otherwise than as drinking milk.

In tuberculous cows the muscle has been found to contain bacilli. Recent investigation proves that tuberculous cows whose udders are not tuberculous can transmit the disease to calves and other animals. The danger in the use of such milk is apparent and the consequent necessity for early finding out the condition of milch cows. The question presents two branches, the healthy condition of the cow at the time of milking and the preservation of the food milk in as nearly a normal condition as possible. It is certain that this cannot be done if the milk proceeds from diseased tissues.

His conclusions were briefly summed up, as follows :

1. It is especially desirable that a system of periodic veterinary inspection be exercised in addition to the dairyman's inspection.

2. Strong views should be held and exercised regarding the nature and quality of food of cows. All decomposed foods, as those which are liable to undergo fermentation, should be

wholly avoided. The best foods are well-ripened grains and grasses.

3. The stables of the cows are a point of great importance. Too often dark, damp, ill-ventilated and crowded pens have been the home of this chief of our food supplies. It is quite possible to keep even on a large scale a dairy stable free from the ordinary disagreeable stable odors. The water supply to the cows is of equal importance.

4. The care of the milk at the time of taking and subsequently is of all points at once the most difficult and the most necessary to supplying a wholesome milk. As De Claux has said: "Cleanliness is everywhere the *sine quâ non*." This means almost a revolution among farmers and dairymen. The sterilizing of all cans and bottles by steam or dry heat and the boiling of all strainers will be necessary.

5. The delivery of milk is of prime importance.

6. When milk has reached the consumer it must be placed in a refrigerator or promptly consumed.

CHINCH BUGS was the subject of the next paper, by Chancellor F. H. Snow, of Kansas State University. He illustrated his subject by showing a collection of the dried insects and a number of drawings. Chinch bugs, he said, destroyed corn, wheat, broom corn, and sorghum, and did \$100,000,000 damage in the United States every year. Having shown what chinch bugs are, and having told of the damage they could work in a single season, he proceeded to explain how the diseases that produced such wholesale destruction were propagated, and how to destroy the bugs. The bugs themselves are found to be subject to an infectious disease; and the process of destroying them consists in capturing those that are diseased, subjecting others to them, and turning them adrift to infect the swarm. Thus: A few diseased bugs were captured. They were put in a large glass, whose bottom was covered with damp sand. They were well supplied with green wheat. As many healthy bugs as could be captured were put into the jar. In thirteen days nearly every bug was dead. As demands for these infected bugs came in—and they came fast—a half dozen dead bugs were put in a pill box and sent to each farmer who wanted to kill bugs. They were instructed to put two hundred or three hundred bugs into a jar with the

infected specimens. Within twenty-four hours all these bugs would catch it too. They were all to be turned loose in the wheat fields. Within three days bugs would be dying fast in that field. Within twelve days the ground would be covered with dead bugs. The disease would not let go so long as there were any bugs whereupon it could work. In at least ninety per cent of the cases reported to him, Professor Snow said his treatment for the pest had been found highly effective.

A FEW CONSIDERATIONS UPON THE PROGRESS OF PUBLIC HYGIENE was the title of a paper read by Dr. J. Ramon Ycaza, of Mexico, representative of the State of Tamaulipas. His paper was in Spanish. As briefly interpreted and explained by Dr. Vargas, of Kansas City, Dr. Ycaza considered the sessions of the association of the utmost importance; he expected them to do much in aiding Mexican officials to improve the sanitary conditions of their country.

NOTES ON THE HYGIENE OF RICE CULTURE, by Dr. Nazario Lomas, Cuernavaca (Moreles, Mexico), member of the Board of Health of the State of Moreles, and Director of the General Hospital, was next read, and also interpreted in abstract by Dr. Vargas. Rice culture, under irrigation, he said, forms swamps which, submitted to the mean temperature of twenty-eight to thirty-three degrees centigrade, breed pestilence and disease. The dry system of rice culture, while not so profitable, is also not so full of danger to public health. Ten hectares of rice under irrigation cause the death of one man. Miasma, fevers, and death emanate from these swamps. In the State of Tamaulipas, where the speaker lives, the matter has already been taken up by the Government.

CAR SANITATION, Report of Committee, by Professor W. W. Daniells, Madison, Wis., chairman, described the efforts in progress by various railroad companies throughout the country to accomplish better ventilation in the coaches, and considerable progress had been made, but there was still much to be done; experiments showed that the atmosphere of sleeping cars particularly was commonly loaded with impurities. The matter of heating is better cared for, and might be considered well enough if the ventilation in connection therewith were properly attended to.

The fourth day opened with the usual routine, after which

THE EXISTING METHODS OF DEALING WITH EMIGRANTS AS RESPECTS INFECTIOUS DISEASES IN ENGLAND AND ON ENGLISH SHIPS, AND THE NOTIFICATION OF INFECTIOUS DISEASES AMONG IMMIGRANTS TO THE UNITED STATES ; THE DUTY OF THE NATIONAL SANITARY AUTHORITIES TO THE SANITARY SERVICE OF THE STATES ; AN EXAMPLE OF SUCH AN ARRANGEMENT BETWEEN THE U. S. AUTHORITIES AND THE STATE BOARD OF HEALTH OF MINNESOTA, by Charles N. Hewitt, M.D., Secretary of the Minnesota State Board of Health, was read. It described in considerable detail the difficulties encountered and measurably overcome by the State Board of Health of Minnesota, in contending with the questions at issue, and urged such action by the sanitary authorities of other States as, in the judgment of Dr. Hewitt, would go far toward protecting the country against the introduction of infectious diseases generally, and particularly small-pox.

THE BATH—ITS NECESSITY AND ITS ADAPTATION, by A. N. Bell, M.D., of Brooklyn, N. Y., was the next paper read (in abstract), published in full on following pages. The new public baths described elicited much interest, and many inquiries were made with a view to their speedy introduction in other places.

Next followed papers on

CONSIDERATIONS UPON THE ENDEMIC CHARACTER OF YELLOW-FEVER UPON THE COAST OF THE GULF OF MEXICO, by Gregorie Mendizabal, M.D., Vera Cruz, Mexico.

SOME HINTS ON DIPHTHERIA IN THE MEXICAN HIGHLANDS, by Dr. Jesus Chico, of Guanajuato, Mexico, and several by title only, for want of time, upon which there was no discussion.

Adjourned *sine die* at 12 o'clock.

The next place of meeting : THE CITY OF MEXICO, November 30, 1892.

Officers elected for the next ensuing year :

President, Dr. FELIX FORMENTO, Member of the State Board of Health of Louisiana ; First Vice-President, Dr. DOMINGO ORVANANOS, Member of the Supreme Board of Health of Mexico ; Second Vice-President, Dr. WALTER WYMAN, Supervising Surgeon-General U. S. Marine Hospital Service ; Secretary, Dr. IRVING A. WATSON, Secretary of

State Board of Health of New Hampshire ; Treasurer, Dr. J. BERRIEN LINDSEY, Secretary of State Board of Health of Tennessee.

ENTERTAINMENTS.

Most of the forenoon of the second day was occupied by a visit to the stock-yards—the most extensive in the country—where all the details were exhibited and explained to the interest of all present.

The afternoon of the third day was taken up by a pleasant excursion into Kansas, tendered by the KANSAS CITY, FORT SCOTT & MEMPHIS RAILROAD.

The train ran down to Paola, giving the excursionists views of the frost-reddened hills near the city, and of corn-laden prairies farther out, and after a few minutes' stop in the village, the engine was shifted around and a start made for home. Coming back, Superintendent FAGIN had the track cleared all the way to the city, and gave the excursionists an example of how fast a Memphis train can run when it tries. Every one was back at the union depot at 6.30 o'clock.

President NETTLETON, Conductor SHIPP, and other officers of the road, the omnipresent and ever-attentive Dr. E. R. LEWIS, chairman of the local committee of arrangements, and his associates on this occasion—Aldermen ROBERTSON, KIMBALL, MANNING, O'SULLIVAN, and others (whose names we failed to get)—were assiduous in their attentions, and eminently successful in their effort to render the excursion agreeably memorable by all who participated in it.

The evening of this day was also taken up by a pleasant entertainment—

RECEPTION BY THE COMMERCIAL CLUB, at the Exchange Building. President GEORGE F. PUTNAM did the honors for the club. Every guest was extended a cordial greeting as he entered the door, and at once shown to the secretary's room, where refreshments were served.

Here the visitors were given the first opportunity of meeting some of the substantial and representative business men of Kansas City. They were there in large numbers, and the manner in which they impressed the visitors was learned when the speech making commenced.

“ We extend to you,” said the president, “ the hospitality

of an organization composed of the business men of Kansas City. It would be useless for me to speak to you upon the greatness of our city and the States of Missouri and Kansas, after the welcome you received upon the first night of your arrival from the governors of the two States. As it would hardly be in keeping for me to say anything except in praise of Kansas City, I will simply pass it by and again extend to you a cordial greeting and a warm welcome, hoping that this is not the last time we will meet with you, and that when you leave us it will be with pleasant remembrances of your experience among the people of Kansas City."

Several members of the association were then called upon, one after another, by the president of the club, for remarks, but nothing was said worthy of record except the unanimous expression of the pleasure of the association at this Kansas City meeting.

THE BATH—ITS NECESSITY AND ADAPTATIONS.*

By A. N. BELL, A.M., M.D.

To thoroughly appreciate the utility of the bath, it is necessary to understand the structure and functions of the skin—the medium through which it acts.

When the skin is looked at with a lens of moderate power, its surface is discovered to be very uneven, and to consist of a multitude of projections or paps—hence the name papillæ. On the palmer surface of the hand and ends of the fingers, where the sense of touch is the most acute, the papillæ may be seen in rows similar to the ridges and furrows of a ploughed field, and so numerous are they that a single square inch comprises upward of 20,000 of them, and every one is supplied with a sensitive nerve. Thus it is, that the skin in its entirety is the organ of touch—in touch not with external things only, but equally with every organ of the body—by a system of communication so complete and so incomparably perfect that no effort of the mind can conceive anything with which to compare it. Moreover, at intervals all along these ridges on the palmer surface of the hand and fingers—indeed, over the

* Read at the Nineteenth Annual Meeting of the American Public Health Association, Kansas City, Mo., October 23d, 1891.

whole cutaneous surface, among the papillæ, where no such ridges are observed, there are frequent *pores*—little pits which mark the openings of the sweat glands. These glands have their seat immediately under the skin in a layer of adipose tissue. They consist of microscopic bundles of spiral tubes, each one about a quarter of an inch long, running through the skin to terminate in the pores. There are in the skin of an average-sized adult about two million of such pores; and to give some idea of the extent of this wonderful drainage system at the surface of our bodies, if it were possible to stretch it out by placing the tubes end to end, there would be about twenty-eight miles of tubing.

The function of the sweat glands is indicated by the name. Each one is supplied with blood vessels and surrounded by a thin muscular covering, with contractile power to drive the secretions of the gland onward toward the pore at the surface. There is no opening to these glands in the opposite direction.

Closely allied to the sweat glands are the hair-follicles, also situated in the subcutaneous tissue. And alongside of each of these is a pair of *sebaceous* glands—the glands which secrete the natural grease with which the hair (and the skin, to some extent) is supplied. And these, too, are provided with muscles which, by their contraction, force out the oily secretion; and this secretion it is chiefly which produces the unpleasant odor common to persons who neglect the bath. It is more or less common to all persons on those parts of the body, as in the arm-pits and between the toes, from which the air and water are most excluded.

Lymphatic vessels also pervade the skin, running the contrary direction, toward the lymphatic glands, situated beneath it. Their function is, mainly, to aid in draining the skin of the waste products of cell life into the lymphatic system, to be disposed of by other processes. Hence it is that, in persons who do not frequently bathe, the lymphatic glands are overworked, become surcharged and swollen, most frequently recognizable at the side of the neck, which engorgements sometimes result in suppuration and scrofula.

In certain parts of the skin of white persons, and in every part of it in colored persons, there is, besides the cutis and cuticle, of which the skin mainly consists, a third layer between these, which partakes somewhat of the character of

both, called the *rete nuscosum*. It is chiefly composed of pigment cells, which cause the darker color of the skin on certain parts of the body in the white races and of the whole skin in the colored races.

Thus it is observed that the skin, instead of being the mere organ of touch with external things, is, in reality, an exceedingly complex and elaborate organ richly supplied with nerves, blood vessels, lymphatic vessels, and an exquisite drainage system, upon which the health of the body in all its parts greatly depends.

Of the nature of sweat, everybody is more or less acquainted, but comparatively few persons appear to appreciate its purpose—to regulate the temperature of the body, which, for the maintenance of health, is confined to narrow limits. A secondary effect of sweating is to remove the *scarf-skin*—the particles of dead cutis which are prone to stick to the surface of the unwashed. It is most commonly observed on the scalp, where it very properly takes the significant name of dandruff, a word derived from two Anglo-Saxon words—*tan drof*—which signify *itch* and *dirt*.

The scarf-skin, in invisible particles, as well as in scales, is particularly abundant after fevers, and especially dangerous after those of an exanthematous character, such as measles, scarlet-fever, and small-pox.

The daily quantity of sweat in an adult, at moderate temperature, has been computed at three pounds; but it is so dependent upon the degree of exercise as to be exceedingly variable. It is always in process, however, in healthy persons, and but rarely suspended in sick ones. Insomuch that persons who do not use the bath, those who habitually allow their skins to be continually smeared with the dirty paste that results from an accumulation of putrefying scarf-skin, grease, and sweat, constantly stink.

To obviate this, and to protect and maintain the functions of the skin for the promotion of health, is the purpose of this paper.

Surely everybody, to be clean, requires the bath—infants and children particularly, because of their greater functional activity; working-people, most of all, because they sweat most, and are, in default of the bath, the dirtiest of all people, but with it, the cleanest, because perspiration is promoted by

exercise, and the scarf-skin is thereby more effectually disposed of; the skin is consequently cleaner and softer. Indeed, it may be truthfully said that persons who never sweat and bathe are never clean; and lazy people are sometimes detectable by the odor emitted from their bodies.

It has already been observed that the sweat-glands perforate the skin spirally, that the pores are their only opening. That any aqueous solution can be made to enter the circulation by the pores is, therefore, highly improbable. The nature of the exudation from the hair follicles and the action of the muscles upon them seem to be quite sufficient, also, to prevent any possible absorption of water through that means. Indeed, it seems abundantly evident that water is not absorbable through the skin; and fortunately it is not. Otherwise there would be greatly increased danger from bathing in filthy water; and even sea water in its greatest purity always holds in solution material which would be poisonous in the quantity that might be so absorbed, if absorbable at all, by long exposure to it.

The longer endurance of thirst consequent upon the continued immersion of shipwrecked persons, and by others in consequence of the continued wetting of their clothes, is due to the arrest of cutaneous evaporation and to the effect upon the nerves.

Indeed, there is no evidence whatever that the salts contained in sea water or mineral waters are ever absorbed through the skin, even in the smallest possible quantities. Such baths are simply stimulating to the skin, more or less, according to the nature of the salts.

It is well known, however, that if the cuticle be broken—removed by a blister, for example—the denuded surface is actively absorptive; and that when the cuticle is not broken, certain medicines in oleaginous solution, such as the preparations of mercury and some of the alkaloids, may be introduced by friction. But these conditions are wholly apart from those common to the bath.

It would extend this paper to inordinate length to consider the great varieties of the bath and their indications with any degree of detail. It must suffice to mention the chief of them, and but briefly. The *tepid*, *warm*, and *hot* baths are indicated by temperatures respectively 85° to 92° , 92° to 98° , and 98°

to 112° Fahr. The *cool* bath has a temperature from 60° to 75°, and the *cold* bath from 60° downward to the freezing point, Fahrenheit.

The ordinary domestic bath—the bath-tub—which has become a practical necessity to all cleanly people who can afford it, and common to domiciles and hotels, is chiefly defective because of the abominable, although almost universal practice of placing it in the same room with the water-closet. Any one who indulges in the luxury of the morning cold bath, the deep and invigorating respiration which it incites and the energetic friction which it prompts, soon acquires repugnance to all sources of impurity in the air of the bath-room. Pure air and plenty of it are conditions no less essential than an abundance of pure water. Hotels which do not provide an abundance of both pure water and pure air, and bathing facilities *ad libitum*, are unworthy of patronage; and “health” resorts without the bath are a misnomer.

Numerous devices have been contrived for increasing the efficiency of the bath, both for the promotion of health and the treatment of the sick, some of which are especially worthy of brief mention. For example :

The *vapor* bath is a favorite method of using warmth and moisture, and on account of its effect in preventing evaporation from the surface, is a powerful agent for increasing bodily temperature. It can be borne at a much higher temperature than the water bath—from 120° to 150° Fahr. By preventing the evaporation of the natural moisture from the skin, and adding steam thereto, apparent profuse perspiration is the common and speedy result; but this is sometimes deceptive. In some states of the system, when excessive perspiration is not easily excited, the condensation of the vapor on the skin is liable to be mistaken for it, and when this occurs the increased temperature of the body that results from such exposure is fraught with danger.

The *Turkish bath* consists in a succession of hot-air processes varying in temperature from 120° to upward of 200° Fahr., subsequent shampooing, and spray douche. With regard to its value, my personal observation fully justifies the remark that it is too apt to be overdone. Like the vapor bath, its object is profuse perspiration. Well persons are never bene-

fited and are sometimes injured by subjecting themselves to the highest temperature common to the Turkish bath ; and sick persons rarely or never need it.

It would be well for persons, particularly the debilitated, who resort to vapor and Turkish baths, to understand that, besides the danger of increasing the bodily temperature inordinately, the profuse perspiration which they excite is very exhausting ; no less so than would be the loss of a pound or more of blood by venesection, or the carthartic effect of an ounce of Epsom salts. Hence the lassitude which is commonly experienced after their use, and often misinterpreted by those who advise them as evidence of induced comfort.

On the whole, I believe such baths, indiscriminately used as they are, do more harm than good ; they are much more of a test of physical endurance than of necessity, and should be discouraged except under competent advice.

Packing with the wet sheet, cold and hot, carries its description with the mention. By its means the stimulating action of the water is reduced to a minimum, and the refrigerating action only is the result. But it may here be remarked, with reference to the distinction which is insisted upon by some medical practitioners and writers upon the subject, it makes little or no difference whether the sheet used be wet with cold water or hot, since the temperature of the skin and the sheet rapidly approximate, and the more rapid evaporation of the hot water speedily induces a degree of cold quite equal to that of the cold sheet, so that the choice might well be left to the fancy of the patient ; the result is the same.

Sulphur baths, or rather *sulphur-vapor* baths, probably have no effect beyond that which would result from the vapor without the sulphur, whether applied as sulphur fumes or sulphuretted gases.

Mud baths are a nasty means of obtaining the results of a protracted warm bath—rarely indicated, and of doubtful benefit.

Of “medicated” baths in general, what has been said of the non-absorptive quality of the skin is sufficiently suggestive, except in so far as the medicines added to the water may be stimulating to the skin, as the salts in sea water and mineral waters, or by the addition of mustard.

Galvanic and *electro-magnetic baths* are deceptions. Whatever benefit is derived from their use is due to the magnetic and electric currents, if applied, wholly independent of the bath ; it adds nothing to the potency.

The *douche*, by which a column of water poured from a height was at one time thought to be particularly adapted to the treatment of violent lunatics, probably because they were incapable of describing its severity. But since Esquirol himself submitted to it, and described the effect of a column twelve feet high falling upon his own head as resembling the continued breaking of a column of ice thereon, and the feeling of stupefaction which lasted for more than an hour afterward, few persons other than lunatics have used it.

The *shower* bath differs from the *douche* only in the division of the stream of water falling upon the head and shoulders ; and the *needle* bath differs from the shower by its general application to the whole surface of the body by means of a perforated coil of pipe within which the bather stands.

The *rain* bath is simply a variety of the needle bath, the shower being from the top only, but inclined, and is that which it is the special purpose of this essay to describe, because it is deemed to be superior to all other devices for the benefit of the working-people and for the public schools, into which it should find speedy introduction.

Hitherto the *people's* bath has generally consisted of an enclosed swimming-bath along the dirty water front of our cities, comprising the largest amount of physical exercise in conjunction with the bath—a condition of surf and sea-shore bathing of great benefit to those who commonly resort thither ; but to the working-people, who have an abundance of exercise and particular need of the bath for cleanliness, no such provision for exercise is required.

For the introduction of the public rain-bath in this country, the people are indebted primarily to Dr. SIMON BARUCH, of New York. In an editorial article by him in the *Philadelphia Medical Times and Register*, August 24th, 1889, after giving a brief review of the public bath in general, as hitherto provided, he proceeds to give a description of the rain-bath as recently adopted in the German army and in several large German cities, in substance as follows :

These baths are simply arranged, built in the most economical yet substantial manner, and divided into spaces just large enough for an adult to stand and move comfortably in. The bather soaps himself, and turns on the cold or warm water, which falls upon him as a spray-douche; the mechanical action of which spray-douche, aided by his own efforts, rapidly cleanses the body, and the water flows away over the latticed floor into a receptacle which conveys it to the drain pipes. The time, consumption of water, and attendance are thus reduced to a minimum; cleanliness of the bathing room is rapidly obtained, and the danger of contagion, which would deter many from resorting to the tub baths, is entirely obviated.

Simple rain baths of warm water and soap should be attached to our public schools, and the afternoon hours should be devoted to the task of cleansing the bodies of the little ones.

The warm rain bath and soap would be a great boon to the poorer and laboring classes in mid-winter, when they rarely if ever have an opportunity, owing to the narrow limits of their dwellings, to cleanse their bodies. To the middle classes the cheapness of such a bath would commend itself.

The construction of a few such baths in our large cities would popularize bathing and protect the community against many diseases, without a large outlay of the people's money.

Only one month subsequent to that editorial Dr. Baruch read a paper at the Social Science meeting at Saratoga on the "Status of Water in Modern Medicine," comprising a plan for the construction of such a bath large enough to accommodate eight thousand bathers daily. And again, a little less than a year ago, at a meeting of the Section of Public Health and Hygiene of the New York Academy of Medicine, he still farther elucidated the subject, and has continued to urge it, as he also did in the New York County Medical Society, with the happy result soon thereafter of seeing it adopted at the New York Juvenile Asylum, where Dr. Baruch is the attending physician; and more recently, on a larger scale, by the Association for Improving the Condition of the Poor.

Dr. Baruch has also been a pioneer in the adaptation of the bath to the treatment of disease, particularly in the treatment

of typhoid-fever. But a detail of it is not within the scope of this paper.

Since my visit to the Juvenile Asylum, a few weeks ago, the superintendent has kindly sent me a report, of which the following is an abstract :

“ Instead of tumbling about in each other’s soiled water, each child receives a clean shower of warm water upon his soaped body, the water at once flowing away. In the same plunge basin in which formerly 80 children were bathed per hour, now 280 are bathed.” And from the report of the asylum for 1890, I extract the following : “ The new bath, which we have introduced on the suggestion of our attending physician, Dr. Simon Baruch, has proved quite satisfactory. It has four advantages : 1. It requires but a minute or two to prepare for bathing. 2. The children bathe in clean water. 3. A large number can bathe in successive companies. 4. It requires only one tenth to one fifth as much water as a plunge bath.”

At the opening of the bath erected by the Association for Improving the Condition of the Poor, August 17th, 1891, John Paton, Esq., the President of the Association, made the following remarks :

“ The Association for Improving the Condition of the Poor is not merely a relief society, but it has ever in view the amelioration of the conditions, often unhealthful and uncomfortable, under which so large a proportion of the inhabitants of this city are compelled to live. It strives to better these conditions through its sanitary department, which is in constant communication with the Board of Health, receiving from the latter the most effective aid and co-operation. It also carries on a great work in sending fifteen hundred to two thousand people, chiefly mothers and children, weekly to its establishment on Coney Island, where they have fresh air, abundant food, sea bathing, and much innocent enjoyment.

“ While New York is eminent for its admirable benevolent and charitable institutions, so generously maintained by its wealthy citizens ; for its public parks, for its abundance of pure water, and for its unequalled situation, it must be admitted that to have due regard to personal cleanliness is very difficult for the many who live in crowded tenements, where

the only facility for bathing is an iron sink in the hall of each floor. Public baths are only available during the summer, the water being salt and far from pure.

“During the past few weeks I have been able to inspect the public baths in Great Britain, which are found in many large cities and towns upon an extensive scale. They are all erected and maintained by the rate payers and vestries under an old Act of Parliament passed in 1846, which gives full powers to the local authorities. A uniform charge of twopence for a second-class and sixpence for a first-class warm bath is made, one penny being charged for a cake of soap. In connection with all the baths are extensive wash houses, where women can bring clothes, etc., to wash, dry, and iron at a fixed charge of one penny per hour. Swimming baths are generally attached and largely used, chiefly by young people. In no case did I find the baths self-supporting, the deficiency being met by taxation or assessment.

“Under these circumstances the New York Association for Improving the Condition of the Poor had resolved to try the experiment of erecting the People’s Baths, now thrown open, and capable of providing nearly one thousand baths daily. These are fitted up with every facility for bathing in comfort, and with all possible sanitary precautions. Following the plan so successfully tried in Vienna, most of the baths are supplied with warm showers or sprays, so that every impurity is immediately carried away and any risk of infection is absolutely removed. For the same reason the towels will be steamed after use, and the cake of soap given to each bather will not again be used in the baths.

“The building has been erected upon a site kindly given by the New York City Mission, at a cost of nearly \$25,000, exclusive of the land. Mr. J. C. Cady, the well-known architect, drew the plans and supervised the work under the direction of Mr. William Gaston Hamilton, chairman of the association’s baths committee. I think that all who inspect or use this establishment will say that it does credit to the taste and skill of these gentlemen.

“A charge of five cents will be made for each bath, including the use of a clean towel and a cake of soap; but tickets will be given on the most favorable terms to institutions, socie-

ties, churches, and donors to the association's funds, so that the advantages of the baths may be widespread and extended. With the kind co-operation of the city authorities and the chief of police, the most perfect order and decorum will be maintained ; for while the People's Baths are to be practically within the reach of all, yet women and children must ever be able to visit them with perfect comfort and confidence.

“ In opening the People's Baths we are making an experiment, and if it succeeds—as we hope it will—other establishments of the same kind will undoubtedly be erected throughout New York and other cities of the Union. Possibly it may be necessary to educate the people up to using these baths ; but my friend Mr. Hamilton is prepared for this, and will even go to the length of adding a cup of hot coffee on a cold day, if needed as an inducement. Our friends of the medical profession have given the baths their strongest indorsement, and tell us that the effects upon the health of New York may be very marked in the future. ‘ *Mens sana in corpore sano* ’ is harder to preserve where filth and impurity impregnate the atmosphere of our crowded city population, and such conditions affect the moral tone as well as the physical.

“ That the People's Baths may be a great boon, leading many to see that cleanliness comes next to godliness, is our aim in this new but promising experiment.”

I have personally inspected this bath—as, indeed, I have all the others in New York, as well those in process of construction as those already open for use—and observed its operation.

There are two entrances from the street, one for men and one for women, and these divisions are kept up throughout the building. Both sides are precisely alike. The entrance in each case leads into a light, airy reception or waiting room, finished in oak, with polished hard wood floors, and plenty of comfortable chairs and settees. A counter in one corner serves as a receptacle for towels and soap, and is presided over by an attendant.

To each applicant is given a long crash towel, thick and soft, and about two feet wide. With this goes a cake of soap, unscented, two inches long, an inch and a half wide, and a quarter of an inch thick. The soap is encased in a paper bag, and the applicant is told to take it home.

THE BATH-ROOM PROPER.

Immediately in the rear of the reception-room and opening directly into it is the bath-room proper. Its roof is of glass, and of course the room is splendidly lighted. Each side of the large room is divided into nine bath-rooms, each of these being about eight feet long by five feet wide. Each room contains hooks for the clothes of the bather, and a rubber cloth to throw over them to keep them dry. At the end farthest from the door are hot and cold water faucets, and a large perforated brass ring through which the water descends in a rain-like shower upon the bather aslant. Fourteen of these rooms have no tubs. The floors are of slate, and there are stationary stools in each. The ironwork of which the partitions are made is painted white, and the walls of the main room are of white glazed tiling. Everything looks as clean and as neat as a new pin. It is to this part of the building that the charge of five cents is made. There are seven rooms in the basement, just as clean, but not quite as commodious as the others ; these are free.

The front part of the building is two stories high, the second floor being occupied by the janitor and his family. The laundry, boiler-room, and furnaces are in the basement. The exterior of the building is handsome. It is in the early Italian style, of light-colored brick and terra cotta, and stands out in strong contrast to its rather dingy surroundings.

As soon as the doors were thrown open for bathing, people began to come in crowds and present their nickels for a bath. There were, of course, at the outset, a good many boys, but men and women of the working classes predominate. Mechanics take their wives and children ; whole families go and stay the allotted twenty minutes, and emerge looking fresh and clean. The largest number who had used the bath in any one day, up to the time of my visit, October 1st, the superintendent informed me, was 661. The bath is open fifteen hours daily.

For the rest I have been kindly furnished the following condensed description by Mr. WILLIAM PAUL GERHARD, Consulting Engineer for Sanitary Works in New York City, and Member of the American Public Health Association. Mr. Gerhard, associated with Messrs. Brunner & Tryon, archi-

fects, of New York City, prepared the plans and specifications for the rain baths at the Demilt Dispensary, at the Hebrew Institute, and for the Baron de Hirsch Fund Baths, and the work was in all cases carried out under his personal superintendence.

I. *Demilt Dispensary*.—In this dispensary, located at the northwest corner of Second Avenue and Twenty-third Street, the baths are located in the basement.

There are six rain baths and one tub bath—the latter for invalids and for children. Provision has, however, been made for the future fitting up of six or more additional baths.

The baths are used by men and women on alternating days of the week.

Each bath consists of two compartments, the dressing-room and the bath proper. Each compartment is about $3\frac{1}{2}$ feet square. The dressing-room has wooden partitions and wooden lattice doors about 7 feet 3 inches high, while the bath proper has walls lined with $1\frac{1}{4}$ -inch blue-veined Italian marble slabs. The floor of both compartments is concreted. The bath-room proper has a depression of about 6 inches in the floor, with a metal strainer over the waste pipe. Each bath has also a large overflow pipe and strainer placed in the side of the depression at a suitable height, and the openings of the strainer are so graduated that while the water flows off, it does not flow out as fast as delivered by the douche; consequently there are always a few inches of water in the bottom of the trough, so that the bather's feet stand immersed in water.

The water is delivered by an inclined rain-douche standing at a height of about $6\frac{1}{2}$ feet from the floor, and under such an angle that the "rain" will not strike above the neck of the bather. The flow of water is under control of a janitor. As soon as the bather is undressed, he steps into the bath compartment and announces, by an electric bell, that he wishes the water turned on. The janitor goes to the valve-board in the waiting-room, notices the number of the bath on the annunciator, opens the respective cold and hot water valve, and allows the water to mix in the mixing chamber. The temperature of the mixture is indicated on a hot-water thermometer, of which there are as many as there are mixing

chambers—viz., six. As soon as the water has been tempered to the right temperature the janitor opens the valve controlling the douche. When the bather has finished he rings the bell once more, and the water is again shut off.

Each bather receives a piece of soap and a towel. The charge for bath, soap, and towel is ten cents, but persons who cannot afford to pay this sum can have a bath without charge.

It was at first contemplated to heat the water with steam in a Tobey hot-water heater, but no steam being available for this purpose, a Boynton hot-water heater was put up in the basement with a 200-gallon tank as a reservoir for hot water.

All water pipes are of galvanized wrought-iron pipe, and the douches are of copper.

The separate bath-tub is used by invalids and by mothers bringing children with them. It is an enamelled, rolled edge iron bath, standing on legs, raised 14 inches high, so as to be at a convenient height to bathe children. The outside of tub, as well as all wooden partitions, are painted with Aspinall's special bath enamel.

The plumbing work pertaining to the baths is carried out in strict accordance with the New York Board of Health regulations. Each bath is trapped separately, and all the traps are amply ventilated.

Water is obtained by meter measurement through a 1-inch tap in street main, and a 2-inch galvanized wrought-iron service pipe.

The lighting is done by gas, and heating by the hot-water heater and some steam pipes.

Mr. Gerhard carried out the following experiments by meter measurement of the quantity of water used in these baths :

The bath-tub, which is $5\frac{1}{2}$ feet long and 24 inches wide, required, when filled to within 5 inches of the overflow, about 6 cubic feet, or 45 U. S. gallons of water. With both faucets running, it took about two minutes to fill the bath-tub. Pressure of water estimated at about 20 pounds per square inch. The douche bath, on the other hand, with both hot and cold water valves about half open, delivered 4.75 cubic feet in five minutes, or 35.625 U. S. gallons in five minutes,

or 7.125 gallons per minute. Allowing three minutes as an average time for shower running for each bather, the water consumption in the douche bath would be about 21.375 U. S. gallons.

In other words, the proportion between water used in ordinary bath-tub and water used for douche bath would be as 45 to 21.375, or more than twice as much for the bath-tub.

II. *Hebrew Institute*.—This is a newly completed building, designed by Messrs. Brunner & Tryon, architects, and located at intersection of Jefferson Street and East Broadway, in the eastern portion of the lower part of New York City. It is intended for similar purposes as the Cooper Institute, and contains a large assembly room, with stage, class-rooms, a reading-room and library, a workshop, gymnasium, and shower baths.

These latter are located on the top floor, and there are in all five shower baths. The floor is made of artificial stone (flintolithic pavement), and is raised one step above the general floor level.

The bath compartments are very roomy, each measuring about 4×5 feet. The walls are lined to a height of 6 feet with blue-veined Italian marble slabs. There are in front of each bath a cloth curtain to prevent splashing, and a light lattice door of wood. In this compartment the bathing under the douche is done; the undressing and dressing is done in an adjoining large room with lockers. The douches and pipes are of nickel-plated brass. Each douche stands at the proper angle of inclination at a height of about $6\frac{1}{2}$ feet from the floor, and each douche is controlled by a self-closing cock with chain and pull attached. The bather turns on the cold water himself, and tempers it to the desired temperature by turning on the hot water. Each mixing chamber has a thermometer attached. While bathing, the chain and pull are hooked up so as to leave both hands of the bather free. The water is supplied from two large tanks located on the roof of the building.

Hot water is obtained from a Tobey hot-water heater, located in the basement, and heated by steam from the heating boilers. This heater differs from ordinary hot-water tanks in having an automatic steam shut-off, operated by means of an

adjustable expansion rod in the top of the heater. This heater is very economical in the use of steam, for when no hot water is drawn the steam-valve closes automatically. A lock-nut and screw on the end of the expansion-rod can be so set and regulated as to open the steam-valve much or little, as may be desired, and thus the desired temperature of the hot water can be regulated at the heater—that is, the heater can be adjusted to give hot water of any desired temperature (within certain limits). Overheating of the water may thus be prevented, and there is consequently no danger of scalding a person by hot water. The heater is the invention of Dr. Tobey, until quite recently the Medical Superintendent of the Toledo State Insane Asylum.

The rooms are lighted by both electric incandescent light and gas. Heating is by direct steam radiators. Ventilating registers are set in the walls, connecting with large outlet flues. All plumbing relating to the baths is arranged in conformity with the rules of the New York Board of Health.

III. *Baron de Hirsch Fund Baths.*—The first baths, erected by the trustees of the Baron de Hirsch Fund, are located in a corner building at the intersection of Henry and Market streets, in the eastern end of lower New York City. A basement and street floor has been rented in a flat or apartment house, and the place transformed into a bath-house after plans and specifications prepared by Mr. Gerhard, assisted by Messrs. Brunner & Tryon as consulting architects.

The street floor is intended for women and the basement for men.

Provision is made for 15 douche baths for men and 15 similar baths for women; but of these there have been for the present put up 9 baths for men and 11 baths for women. Besides the douche baths, the street floor contains one bathtub for invalids' and children's use, two water-closets, one slop sink, and one drinking-trough. The basement contains one drinking-trough, one slop sink, a water-closet and a urinal, two hot-water heaters, and a large hot-water tank. Each floor contains a small office, with railing, desk, and chair, where the tickets are told. Baths for adults, with soap and towel, will cost five cents; and for each child a charge of two cents is made.

The floor is made throughout of artificial cement stone, and all the douche baths have depressed basins moulded in cement for the bather to stand in. The arrangement of each bath is similar to that in the Demilt Dispensary, except that for all partitions and divisions galvanized corrugated iron is used instead of wood or marble. This galvanized corrugated iron is fastened to angle and T irons, and all iron work is painted with five coats of special bath enamel, white color. Each bath compartment contains, besides the rain douche, a soap-cup and hook to fasten the pull of the self-closing bibb. Each dressing compartment contains a hard-wood seat and six enamelled iron clothes-hooks. The dimensions of each bath are approximately 8 feet deep by 4 feet wide, and the bath proper is $3\frac{1}{2}$ to 4 feet deep and 4 feet wide.

Water is obtained by direct street pressure through a 1-inch tap and 2-inch galvanized wrought-iron service pipe, on which a 2-inch Thomson water meter is placed.

In these baths hot water is generated in two Hitchings' hot-water heaters, and it is stored in a 400-gallon galvanized hot-water tank. From here the hot water is carried to a large mixing chamber of 30 gallons' capacity, and the cold water is also carried to same, and the two are mixed here by the bath attendant or janitor to the desired temperature, which is indicated by a special hot-water thermometer. The tempered water is carried to the douches at each bath, so that the bather cannot control the temperature personally. On the other hand, he can, by means of the self-closing bibb controlling the douche, open the latter and allow it to run when and as long as he pleases. This arrangement was adopted to obviate the necessity of having a large number of electric bells. All water pipes are of galvanized wrought iron, and the douches are of copper, of special construction and shape.

Cold water is supplied directly to the drinking-troughs, water-closets and the urinal, also to hose-bibbs for washing the entire floor. Both hot and cold water are supplied to the slop sinks and to the ordinary bath-tub for children's use.

On each floor there are two floor cesspools to remove water from floor washing.

The best sanitary fixtures and appliances are used throughout—porcelain hopper closets, with flush operated automati-

cally by seat action ; porcelain urinal with intermittent automatic flush ; porcelain glazed rim slop sinks, and porcelain drinking-troughs. The bath is of enamelled iron, with glazed rolled edge, and stands on high legs. All walls, iron work, pipes, the slop sinks and the tub, etc., are painted with five coats of white bath enamel paint.

All the plumbing conforms to the New York Board of Health regulations.

The rooms are lighted with gas—electric light not being available in the district—and the heating is done by means of direct hot water radiation. Efficient ventilation is provided by means of a large 16 × 24-inch galvanized-iron flue, inside of which the 11-inch round smoke-pipe from the heaters is carried to the top of the roof of the building. From this flue branch vent ducts are carried to each floor.

THE INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY, HELD IN LONDON, AU- GUST 10TH-17TH, 1891.

(From the *Medical Record*. Continued from page 457.)

FOURTH DAY, THURSDAY, AUGUST 13TH.

SECTION ON STATE HYGIENE.

STATE CONTROL IN REFERENCE TO THE HOMES OF THE WORKING CLASSES.—Papers were read on this subject by Dr. Elgin Gould, of Washington, Mr. John Hamer, Dr. Theodore Thomson, Mr. G. M. Burroughs, and one by Mr. Henry Rutherford. An animated discussion followed, in which most of the speakers expressed themselves in favor of State control, though some objections were raised.

Dr. Elgin Gould, in replying, said that most of the difficulties mentioned had been solved in the United States, and suggested a study of the sanitary legislation of the city and State of New York.

Dr. Danford Thomas then read a paper on "State Control of the Sale of Poisons." At the close of the discussion on this paper the following resolution was proposed and carried :

"That in the opinion of the International Congress of Hygiene and Demography it is essential, in the public interests, that the existing law regulating the sale of poisons should be amended, and greater restriction placed on the sale of poisons, and this especially in Great Britain and her colonies."

DIVISION OF DEMOGRAPHY.—The first paper read in the third day's session was on "The Temporary Migration of Labor," by Mr. Ravenstein. This was followed by one by M. Levasseur on "Migration within France." A discussion on "The Suitability of Tropical Highlands for European Settlement" was introduced by Dr. Felkin, and papers read on the subject by Surgeon-General Sir William Moore, Dr. Van der Burg, and Mr. Clements Markham.

Dr. Van der Burg concluded that the colonization of tropical highlands was physiologically possible, but that field labors would have to be excluded, and that such colonization was not possible for economic reasons.

Mr. Fox read a letter from Dr. Giles, written in India, in which Dr. Giles ridiculed the notion that there was any marked difference between English children brought up in India and those brought up in England.

Professor Stokvis, of Amsterdam, denied that there was such a disease as tropical anæmia.

Surgeon-General Ewart thought there was no chance of elevated tropical regions ever becoming colonized by true Europeans.

Mr. Haviland read a paper on "The Influence of Clays and Limestones on Medical Geography," and Mr. William Tapley one on "The Influence of Geology on Health and the Districts of Disease." At the close of the latter, Sir Henry Acland suggested that the greater prevalence of phthisis on damp soils might be due to the bacillus tuberculosis requiring such soils for their life and growth, so that geographical conditions would only in a secondary manner influence the prevalence of phthisis.

DISPOSAL OF THE DEAD.—A discussion was inaugurated by the reading of a paper by Sir Henry Thompson, entitled "Recent Proposals Relating to Burial and Cremation, and the Importance of Disinfecting all Bodies Dying from Infectious Disease, with Remarks on the Present System of Certi-

fying the Cause of Death." The author maintained that the ordinary method of burial was a danger to the living—especially in the case of persons dying from zymotic disease—and that pollution of sources of water-supply was a common occurrence in the neighborhood of graveyards and cemeteries. He admitted that in light, dry soils and elevated spots—the most salubrious, he remarked, for human habitation—it might be possible to adopt interment in perishable coffins or in close contact with the soil itself. Cremation, however, was preferable. For bodies certified to have died from infectious disease it should be made compulsory to either cremate them or bury them in capacious coffins filled with quicklime. In view of the increasing preference for cremation it was essential to demand, at the same time, that the official determination of the causes of death should in all cases be more complete than had hitherto been the case in this country.

RATIONAL DISPOSAL OF THE DEAD.—Mr. Seymour Haden followed with a paper on "The Rational Disposal of the Dead: A Plea for Legislation." In this paper Mr. Haden reiterated the views he has so long advocated as to the desirability of earth-to-earth burial. He has for many years been active in directing attention to the evils of the present system of interment, and his paper was a very interesting *résumé* of the subject. He contended that in earth-to-earth burial the decomposition of the body was accomplished rapidly in an innocuous manner, and that cremation was not only unnecessary but an incentive to crime.

A discussion ensued, which was, on the whole, favorable to cremation, and the following resolutions were passed with only a few dissentients: "That governments should be urged to remove all legislative obstacles to the cremation of bodies." "That governments be urged to adopt cremation of bodies on the battle-field." "That the cremation of the dead is a rational and hygienic procedure, which is especially called for where death occurs from contagious disease."

SECTION ON PREVENTIVE MEDICINE.

THE USE AND ABUSE OF ALCOHOL.—Sir Dyce Duckworth said he felt he approached the subject in a proper spirit in one way, for he was temperate in his views on it. He main-

tained that alcohol was not an unmixed evil, and remarked that there were other forms of excess, so that we might as well talk of abolishing bread-and-butter as alcohol. He believed the abuse of alcohol was less prevalent than formerly. There was no evidence to show that the moderate use of alcohol was injurious; but the question at once arose, what was moderation? In his opinion from one ounce to one ounce and a half of alcohol per day—in whatever form taken—was sufficient for an adult (children required none). This amount should be taken with a meal, and preferably when work was done. If the use of alcohol to this extent were not harmful, it was actually beneficial. Turning to the question of misuse, he expressed himself in favor of a certain amount of local option. He classed the examples of chronic drunkenness under two heads: 1. The foolish, callous, vicious drunkard. 2. The victim of inherited, or, in some cases, acquired nervous disease. Physicians alone could discriminate between the two classes; but, having done so, the treatment of the second class should be medical. But the first class should be stringently treated.

Professor Westergaard, of Copenhagen, then read a paper on "The Relation of Alcoholism to Public Health, and the Methods to be Adopted for its Prevention." He disapproved of Maine laws and of local option, but thought the high-license system was more effective. He considered a limitation of the hours was quite necessary, and pointed out that in Norway the sale of spirits was forbidden from Saturday afternoon till Monday morning.

Several speakers joined in the discussion, which was brought to a close by Sir V. K. Barrington, who spoke of the connection between drunkenness, lunacy, and idiocy, and strongly upheld the Norwegian system, which had transformed that country from the most drunken to the most sober in Europe.

SECTION ON BACTERIOLOGY.

TUBERCULOSIS.—A discussion on tuberculosis was introduced by Dr. Burdon Sanderson, who dealt chiefly with the question of etiology. He said there were not as yet enough facts to say definitely that tubercle taken by the intestine produced general tuberculosis, but in children tubercles of

the intestine were followed by tubercles of the glands and the bones, so that we might infer that the same might occur in the adult. We were in great want of more experimental research. More evidence was wanting as to the cause of tubercle in infancy. With regard to government administration, Dr. Sanderson advised a strict system of inspection extending over the whole country, acting equally in different parts. Tubercle should be included in the Infectious Diseases Prevention Act. About five per thousand of cattle were generally condemned as tuberculous. This involved compensation, which would involve (very small) extra taxation.

THE ALLEGED DANGER OF CONSUMING THE APPARENTLY HEALTHY MEAT AND MILK OF TUBERCULOUS ANIMALS.—Professor Bang, of Copenhagen, read a paper with this title. He described some experiments which he had made, and said that, on the whole, he did not think the milk from a tuberculous cow, with udders apparently healthy, was dangerous, though it was sometimes so, and was always suspicious. Meat was not a source of danger so long as the malady was localized.

ON THE TRANSMISSION OF TUBERCULOSIS FROM ANIMALS TO MAN, BY MEANS OF FLESH AND MILK, DERIVED FROM TUBERCULOUS ANIMALS.—This paper was by Professor McFadyean and Dr. Sims Woodhead. They thought the main cause of tuberculosis was from animals. The danger of tuberculous milk, however, was diminished by dilution with sound milk. There was great necessity for a fortnightly inspection of milch cows by a veterinary surgeon. No phthisical person should be allowed in a dairy.

M. Arloing proposed that the etiology of tubercular disease of early infancy, between three months and five years, be referred for discussion to the next Congress. This was seconded by Dr. S. Gibbon and carried unanimously.

The President, Sir Joseph Lister, said he was pleased to find that spontaneous tubercle was never seen in the sheep, so we could eat mutton with safety.

KOCH'S METHOD.—Professor Ehrlich read a paper on "Koch's New Method of Treating Tuberculosis," and described the methods of Moritz, Biedert, Guttmann, and Langenbrich. All of these processes were based upon the ap-

plication of small but repeated doses, of gradually increasing strength, and their advantages were that the undesirable inflammatory effects of the remedy were avoided.

Professor Cornil, of Paris, Dr. Bardach, of Odessa, Dr. Penfick, and Professor Hueppe narrated their experiences with tuberculin, and Dr. Hunter described some experiments he had made, in which he had succeeded in isolating three substances—viz., one which caused fever, but no local action ; 2, one which caused local action, but no fever ; 3, one which gave neither, but had the remedial effect.

THE INSPECTION OF MEAT WITH REGARD TO THE PREVENTION OF DISEASE.—Dr. Francis Vacher read a paper on this subject, in which he urged the adoption of the following measures : The general provision of public abattoirs ; closing of private slaughter-houses ; licensing and registering of all butchers and their premises ; appointment of competent inspectors of meat ; general systematic inspection of animals and meat intended for food ; appointment of competent assessors to sit with magistrates, and assist them when necessary in the hearing of cases relating to diseased meat.

SECTION ON INFANCY, CHILDHOOD, AND SCHOOL LIFE.

CHILDREN AND THE STATE.—The first paper read was on "Neglected Children in our Towns and Cities," by Mr. William Mitchell, Chairman of the Glasgow School Board, who proposed legislative, social, and individual remedies. A discussion followed, and then Dr. Victor Desguin read his paper on "The Treatment of Orphans Considered in its Physical and Moral Aspects."

The Rev. J. Llewellyn Davies read a paper on "Free Dinners for School Children."

Mrs. Besant proposed a resolution which was finally carried in the following amended form : "That this Congress, asserting the duty of the State toward its future citizens in the matter of education, declares that the feeding or clothing of destitute or neglected children is necessary for their efficient education. Where such destitution or neglect is due to the misconduct of the parents or guardians of the child, it is the duty of the legislature to visit that misconduct with penal consequences."

SECTION ON CHEMISTRY AND PHYSICS IN RELATION TO
HYGIENE.

CONTAMINATED WATER-SUPPLY.—Dr. Percy Frankland read a paper on “The Present State of our Knowledge Concerning the Self-Purification of Rivers.” He contended that the evidence of self-purification was wholly inadequate to justify the use for town-supply of river water which had received sewage contamination.

A number of papers on the disposal of house refuse were read and discussed, an almost unanimous opinion being expressed in favor of the destruction by fire of such refuse.

SECTION ON NAVAL AND MILITARY HYGIENE.

ENTERIC-FEVER.—A discussion on this subject took place, introduced by papers by Dr. Lane Notter, Surgeon A. M. Davies, Dr. J. Edward Squire, and Dr. Schneider.

Dr. Notter concluded that the apparent increase in the mortality from enteric-fever in India was due to the fact that deaths formerly returned as from remittent-fever were now returned as from enteric-fever.

Dr. Davies thought the enteric-fever of campaigns was of pathogenic origin, due to a specific bacterial parasite, which parasite need not necessarily be derived from a pre-existing case, but might have developed its specific characters and disease-producing properties by a process of evolution under favoring conditions.

Dr. Schneider said that the diminution in typhoid sickness and mortality in the French Army had not only been continuous but also progressive.

Brigade-Surgeon Staples drew special attention to two chief factors underlying the development of the disease in India—viz., the undue susceptibility of the newly arrived in the country, and the still greater susceptibility of those who arrived at an undue season of the year. He drew the practical conclusion that as regarded the Bengal European Army it was necessary to retain the soldiers and to resort to the old system of landing troops in that country which gave them the cold weather before the dry season began.

Surgeon-General Marston concurred as to the importance of selecting the right season for sending out our troops to hot

climates, and, in case of war, he thought more might sometimes be done in the selection of regiments.

Brigade-Surgeon Harvey said he had seen many cases of enteric and many of remittent-fever; many also of a fever which used to be returned as remittent, but which was now entered as enteric, thus raising the apparent numbers of the disease. In these cases the temperature charts did not correspond with the typical charts given by Wunderlich and others. He had for some time thought there might be another variety of fever intermediate between enteric and remittent, yet differing from the one in important particulars—especially the range of temperature and the pathological appearances, and from the other in not being influenced by quinine. In our last little war on the Miranzai frontier fourteen cases of remittent-fever were returned among the native troops and followers, and among the British troops, while six cases among the latter were returned as enteric. If we accepted Surgeon Davies's theory of possible origin, there was no difficulty in accounting for them; but if we considered the disease to have a specific origin, then, as the men had left India longer than the longest supposed incubation period, and the native population knew nothing of a fever lasting three weeks and ending in death, it was difficult to account for them. None of the men died; but the temperature charts did not correspond with the Eastern type, and were similar to those of the remittent-fever cases among the native troops. He thought that pending further investigation the term typho-malarial, as recognized by the American nosology, might be used provisionally and as a matter of convenience. He did not consider that the use of this term implied a belief that enteric and malarial-fever were combined, the typhoid state being common to many diseases.

Brigade-Surgeon Maunsell said that in India troops in cantonments could be protected by improving the conservancy; the system might be good theoretically, but practically it was very faulty.

Surgeon-Major Robinson said typho-malarial-fever was a disease worthy of more investigation. The name had lately been admitted to our nosology, but it did not seem to him a good one, as a combination of two specific fevers did not con-

stitute a separate disease. The disease differed from ordinary enteric in important respects—especially as to prolonged incubation and protracted convalescence. It occurred very largely in recent Egyptian campaigns.

Dr. Godfrey, of the U. S. Marine Hospital Service, said that a series of cases observed in the hospital of which he had charge, in which the typhoid-fever was interfered with so as to cause a suspicion of mixed disease, showed by culture methods and microscopic examination that the patients were all invaded by the bacillus of Eberth, and the plasmodium of Laveran. These patients all came from one place, had drunk the same water, and been subjected to the same miasm. In America those places were most exempt from typhoid where river water held in upper ground cisterns was drunk.

Brigade-Surgeon Key said typho-malarial might or might not be a good name; but for the safety of the soldier we should do well to look at doubtful cases as belonging to the graver or enteric form.

Dr. Cayle said one of the modes of spread of typhoid-fever, cholera, and other diseases which probably depended on the introduction of a definite poison into the system, was by means of the dust carried in the atmosphere. This applied to India and nearly all continental countries.

Professor Notter and Dr. Davies then replied. The former said, in reply to Surgeon-General Marston, that we must prevent specific disease by studying the environment of specific cause. Take cholera bacilli. They would not grow in an acid medium. The stomach was alkaline after fasting. The practical bearing of this was to use acid drinks and not to enter a hospital when the stomach was empty. Future research would tell us what were the conditions most favorable to Eberth's bacilli. As a practical conclusion he would say, "Dry your soil, and endeavor to control the variation in the water-level." He did not think Brigade-Surgeon Harvey's cases were enteric.

Dr. Davies, in reply, said nearly all the speakers endorsed the pathogenic theory of origin. This was a justification for his dwelling on the fact that the experience of army medical officers was not in accordance with current teaching as to the necessity of a specific contagion. The most recent bacterio-

logical investigation tended to show that there was not one micro-organism responsible for the causation of typhoid-fever, but several. This harmonized with the experience of army officers that there was more than one form of fever met with in campaigns. Evolution might cause these variations.

DIVISION OF DEMOGRAPHY.—Mr. H. S. Hallett read a paper on "India Factory Legislation." Mr. Hallett urged that there was a case for protecting workshops and minor factories which had been excluded from the Act. Owing to this exclusion, children of any age might be employed in workshops for any number of hours by day or night, and under most unsanitary conditions.

Madame le Dr. A. C. Katchef read a paper on "Home Work in Russia," in which she said the economic and hygienic position of such workers (known in Russia as "koustari") was deplorable.

RELATIVE AGES OF HUSBAND AND WIFE.—Dr. Joseph Körosi, Director of Municipal Statistics, Buda-Pesth, then read a paper on "The Influence of the Age of Parents on the Vitality of their Children." The author urged that girls should not marry at all under twenty, and that women under thirty, or even thirty-five, should avoid marriage with men over fifty. Women above thirty-five had no unfavorable chances to fear by choosing a husband above fifty, and these same women, and even those from thirty to thirty-five, would do well to avoid union with young men, as it seemed probable that their children would be more exposed to hydrocephalus or inborn debility. Males should therefore generally renounce to the youngest girls under twenty or nineteen years of age; if between twenty and thirty, they should avoid marrying women above thirty-five; if at the age of fifty, they had approached the end of male generative power, and they should select no younger woman than above thirty-five.

Dr. Singer remarked that the variation of mortality of children in relation to the age of mothers, as shown by Dr. Körosi, might be in connection with the fact that the marriage age among the working classes was a comparatively young one, whereas among those in a better social position marriage took place later.

FIFTH DAY, FRIDAY, AUGUST 14TH.

SECTION ON BACTERIOLOGY.

DISINFECTION OF THE LIVING BODY.—Dr. Hunter gave a *résumé* of Dr. Behring's paper on this subject. The author said that down to 1883 it was not thought possible to render harmless pathogenic germs in the living body, but the work of Pasteur and Koch had shown this theory to be false. Antiseptics acted both on the bacilli and on their chemical products, so that disinfection must be held to apply to these poisonous chemical products as well as to the bacilli themselves. The spleen of a mouse dead with anthrax was rendered innocuous by exposure to the blood of an animal "immune" to anthrax. The action of a combination of corrosive sublimate and chloroborate of sodium was very marked. The disinfecting power was only seen in animals after subcutaneous injection close to the original inoculation one or two minutes after such inoculation had been made. But the action was partly general, producing general changes in the blood which rendered it unsuitable to the growth of anthrax bacilli. Behring concluded that there was a great future before us in the discovery of these valuable combinations. In diphtheria the best chemical disinfectant was terchloride of iron. Corrosive sublimate and zinc, as described by Lister, were also effective. After animals had acquired a certain degree of immunity, these chemical agents acted in a different way. The results of his experiments showed that not only the bacilli but their chemical products were acted on. It was doubtful whether we could influence the functions of living cells for curative purposes. In the general treatment of infectious disease we must recognize the principle which Lister had applied in the local treatment of traumatic lesions—viz., to keep away or make innocuous the heterogeneous causes of disease, but to leave in quiet living cells and living tissues.

Dr. Roux inclined more to the belief that immunity was conferred by the direct action of the cells on the bacilli than by any chemical action which he regarded as incomprehensible.

The president said he regarded phagocytes as one regards higher animals which are gifted with an intelligence, and not

only a chemical action. He thought we must not look merely to chemical action.

TESTING DISINFECTANTS.—The next paper was by Professor Max Gruber on "The Methods of Testing Disinfectants." The author showed that when tested by proper methods, such as he described, the disinfectant powers of most substances proved to be considerably less than had usually been conceived. In his experience the best agents proved to be carbolic acid, lysol, and a preparation of kresole which he had recently had prepared.

IMMUNITY.—Next followed a paper by Dr. Armand Ruffer on "Some Experiments on the Mechanism of Natural and Artificial Immunity." The author's experiments were chiefly made with the bacillus *chauvœi* (*charbon symptomatique*, Rausch-brand, quarter evil), and as the result of them he arrived at the following conclusions: That the natural immunity of rabbits, and the artificial immunity of guinea-pigs was not due to the absence of nourishing material. That the dead serum of non-immune animals had a more powerful action on the bacillus *chauvœi* than the serum of immune animals; the living fluids of non-immune, naturally immune, and artificially immune animals had no power of destroying the same. By allowing an extremely weak virus to grow in the living fluids of a naturally or artificially immune animal, and protecting it from the action of the wandering cells the virus became so intensified that when re-inoculated into the same or any other immune animal it caused death. The living fluids of a febrile animal had no bactericidal powers for the micro-organisms which produced the fever. The virus which, protected from the action of wandering cells, had lived for three, five, seven, or more days in the living fluids of febrile animals became extremely intensified. The inflammatory reaction, or rather the emigration of wandering cells to the point of inoculation, was inversely proportional to the number of micro-organisms introduced. The number of micro-organisms which penetrated from the point of inoculation into the tissues and general circulation was inversely proportional to the number of wandering cells which had emigrated to the points of inoculation. There was evidence that the leucocytes were attracted to the point of inoculation by a chemical

poison, and that they absorbed bacilli while the latter were still alive. He had found experimentally that in acute infectious diseases the leucocytes did not emigrate, and that the absence of inflammatory reaction was not solely due to paralysis of leucocytes, or to vascular alterations, but to other and more complex causes. Experiments showed also that though leucocytes refused to emigrate, they might be very active, and whenever they were prevented—either mechanically or otherwise—from reaching the virus, the disease ended fatally in naturally or artificially immune animals. Iodine in certain strengths had an attraction for leucocytes, while lactic acid and benzol repelled them.

Dr. Roux read a paper on “The Practical Value of Preventive Inoculation,” in which he maintained the superior value of preventive inoculations with attenuated virus over chemical inoculations.

Professor Babes read a paper on “Rabies and its Treatment.” He said Pasteur’s method was, with certain modifications, the best treatment. Professor Babes had, as long ago as 1886, pointed out the necessity for the passage from weak to strong injections being regular. The patient should be inoculated as soon as possible after infection. Bites in the neighborhood of and involving nerves were most fatal, hence the depth of the wound and its situation were of importance.

SECTION ON THE RELATION OF THE DISEASES OF ANIMALS TO THOSE OF MAN.

ACTINOMYCOSIS.—A discussion on diseases communicable from animals to man, and *vice versa*, was opened by Professor Crookshank, who said he would deal exclusively with a disease common to man and animals which had interested him for some years more than any other—viz., actinomycosis. This, he said, had frequently been referred to as a new disease, but the various manifestations of it had been met with for more than half a century, though misunderstood and misnamed. From contemporary literature there could be no doubt that it was very prevalent in Scotland in 1827–39. By the researches of Israel and Ponjick in Germany, and the recognition of a case in man by Acland in this country, a new field of inquiry had been opened up. The disease was not

new in man, but it had not been differentiated from the diseases which it simulated. In 1848 M. Louis met with a pulmonary affection supposed to be cancerous. Mr. Lebert found in the pus—and made a drawing of—the tufts of club-shaped elements with which we were now so familiar. Nearly two hundred cases in man had been described, and about five per cent had occurred in this country. Professor Crookshank suggested that the resemblance of the disease to tuberculosis might explain the reports of a very high percentage of cases of tuberculosis in cattle, both in this country and the colonies. He thought the disease was rarely if ever the result of direct infection from cow to cow, or from cow to man. There was reason for believing that man and animals derived the disease from a common source, and a strong suspicion attached to cereals.

Professor Nocard referred to the irregular geographical distribution of the disease. He thought the disease spread in certain food-stuffs, and that in certain districts the pasture was infected with the germs of the parasite. In a recent outbreak a large number of wolves and cows were all attacked simultaneously with the different forms of the disease. In such a district man could also be infected if he ate green food uncooked. The question of man infecting animals, or animals affecting man did not seem to Professor Nocard to arise.

Dr. Salmon said the statements in regard to the prevalence and contagiousness of actinomycosis in the United States has been greatly exaggerated. So far from there being four or five per cent of the bovine animals in the United States affected with actinomycosis, it was probable, from the results of the national inspection recently established, that there were not over one or two per thousand among the beef cattle which arrived at the stockyards. Public opinion in the States would not tolerate the utilization of the carcasses of animals affected even in the slightest degree.

Mr. Goodall, of Christchurch, said our present knowledge seemed to prove that the parasite was a fungus which found its normal habitat in vegetable structures and was only accidental in animals. He suggested that a conference such as the present should carry their deliberations to the utmost, and not rest with the diseases communicable from animals to

man, but from the vegetable to the animal world. He begged to call attention to the part played by the larvæ of dipterous insects from a hygienic point of view. These larvæ were reported to feed on decomposing organic matter, but their mouths were so constructed that this was impossible ; doubtless they fed on the lower forms of animal life and thus kept these forms of life in check.

Professor Walley said he was not previously aware that internal lesions were commonly found in cattle. Professor Crookshank's remarks showed the necessity of dealing with actinomycosis as a contagious disease equally with tuberculosis. He failed to see how it could be held not to be contagious. The sooner the better the disease should be scheduled, together with tuberculosis, as a contagious disease.

Professor Crookshank then replied. He said that as to the question of the disease being confounded with tuberculosis, there was no doubt the great fear which had arisen in consequence of the statement as to the prevalence of tuberculosis would be allayed if it were found that the less serious disease, actinomycosis, had been confounded with it. His remarks applied more particularly to those cases of what had always been considered scrofulous, but which were really examples of actinomycosis.

SECTION ON INFANCY, CHILDHOOD, AND SCHOOL LIFE.

THE CARE AND TREATMENT OF EPILEPTIC, MENTALLY FEEBLE, AND IMBECILE CHILDREN was the title of a paper read by Dr. Fletcher Beach. The author said that these constituted three perfectly distinct classes of cases, and the care and treatment of each should proceed on different lines. He proposed that homes should be prepared for epileptic children where they could be trained mentally and physically, and where medical treatment could be pursued. He suggested that auxiliary schools, similar to those in Norway and Germany, should be established for feeble-minded children, in which instruction adapted to their powers should be given by teachers experienced in the methods required to call out the faculties in such cases. He remarked that the provisions at present made for imbecile children were very defective.

The next paper read was by Dr. Shuttleworth, on " The

Care of the Mentally Feeble Child, as Distinguished from the Imbecile." A paper by Dr. Kotelmann followed. Some discussion ensued, and the following resolution was carried: "That this Congress do appoint a commission, consisting of persons generally conversant in, 1, examination of the physical condition of children; 2, mental condition of children; 3, education, and methods of dealing with children; 4, statistical compilation of facts; whose duty it should be to inquire into the condition of children in schools and elsewhere, and carry out the same upon a fixed plan. This Congress empowers the commission to add to their number, and to appeal to recognized authorities or sources for assistance if necessary."

The next paper was on "The Education of the Blind," and was by Dr. Campbell, Principal of the Royal College for the Blind. At its close the author proposed a resolution which was subsequently passed in the following amended form: "That the time has come when the blind, deaf, and dumb should have a well-graded, practical, and comprehensive course of instruction; that the training of the blind, deaf, and dumb should not be conducted on a charitable basis, but formed on a national system of education."

SECTION ON CHEMISTRY AND PHYSICS IN RELATION TO HYGIENE.

METEOROLOGY IN RELATION TO HYGIENE.—Dr. Buchan read a paper on this subject. The author said he thought no city could be compared with London as affording the best available material for an inquiry into the relation of weather to health. He found the highest mortality occurred during the months of lowest temperature. He also noticed that the death-rate rose in proportion to the density and persistency of the fog.

Dr. Russell remarked that when there was a great increase of death-rate in foggy weather a low temperature accompanied the fog, but that there were dense fogs without decrease of temperature, and then the death-rate did not fall below the average.

Dr. Longstaff observed that meteorological curves and curves of death could not correspond exactly, owing to the

fact that the interval between the death and its registration averaged about five days, and the interval between the commencement of an illness and a resultant death was of uncertain, often considerable duration. He thought that meteorological changes were not of themselves the cause of death, though the number of deaths appeared to be contributed to by these changes.

Dr. Tripe said the effects of fog varied very much, according to their density and quality.

Dr. North drew attention to curves drawn by Professor Tacchini, showing the relation between the rainfall in the months of March, April, and May and the number of cases of fever in the province of Rome in the autumn. As the result of his own experience in the Roman Campagna, he entertained grave doubts as to the possibility of explaining the phenomena of intermittent-fever on the hypothesis of a pathogenic organism.

SECTION ON STATE HYGIENE.

Several papers were read on the subject of the "Notification of Infectious Diseases." Considerable discussion ensued, and the following resolution was carried by a large majority: "That notification of infectious diseases in all countries should be compulsory."

Papers on the "Prevention of Venereal Disease" were read by Dr. Birbeck Nevins and Mr. J. Holroyde. Several papers on the "Need for Popular Instruction in Hygiene in Schools" were read, and one on "Popular Instruction in Preventive Dentistry," by Mr. George Cunningham, of Cambridge.

In the Division of Demography, Colonel Woodhull, of the U. S. Army, read a paper prepared by Colonel Charles R. Greenleaf and Major Smart, of the U. S. Army, on "Personal Identification by Scars, Marks," etc.

The President of the Section, Mr. Galton, F.R.S., read a paper on "The Exhibition of Finger Prints, and of Registers of them as a Means of Personal Identification."

Dr. Bertillon gave an account of the anthropometrical method of identification of criminals, etc., worked out by his brother, Dr. Alphonse Bertillon.

Dr. Francis Warner read a paper on "The Physical Condition of Children Seen in Schools and the Local Distribution of Conditions of Local Development." In this paper Dr. Warner gave an account of fifty thousand children whom he examined for a joint committee of the British Medical Association and the Charity Organization Society.

A paper by Messrs. J. S. Turner and N. B. Paterson followed, on the "Examination of the Teeth of School Children," and the last paper was by Miss Fanny Fowke, on "The Physical Condition of Pauper Children Boarded out Under Local Government Board Orders."

A discussion followed the reading of these three papers. The following resolution was carried unanimously: "That an investigation which has been made in regard to the conditions of bodily development and brain action in some fifty thousand children indicates new and grave problems respecting the provisions necessary for the care and training of those who are more or less defective in make, and also respecting the causation, in certain districts, of mal-developments which are much associated with defects of the brain, and that an extended scientific inquiry is desirable for the further elucidation of the subject."

THE TRUTH ABOUT VACCINATION.

VI.

DR. CORBALLY, in his reply to my article in the November number of *THE SANITARIAN*, takes me to task for not devoting more time in this discussion to his paper entitled "The Protective Power of Vaccination." I would gladly have followed the doctor's paper more carefully, but the limit of space rendered it impossible to do so, and at the same time to take up the arguments of the other disputants in this controversy. He next makes a play upon words which is far from logical. A disease may be said to be universal, even though every living person be not affected by it. Dr. Corbally's article, above referred to, contains these words: "Unlike other zymotic diseases, all races seem susceptible to it; all ages are liable to be attacked, though children are more frequently the victims than others." Now, if all races and all ages are liable

to this disease, it is not improper to say that the disease is a universal one. Other writers assert that "a majority of mankind must necessarily suffer from it;" and in connecting these two phrases in my first article, I simply gave in brief what has been claimed regarding the universality of small-pox prior to vaccination.

Again, the doctor seems ignorant of the Chinese theory regarding small-pox. The Chinese claim that the poison of small-pox is introduced into the system *ab utero*, and remains concealed until it is developed through the agency of some external exciting cause. Their theory of inoculation was therefore consistent, because they supposed that this practice drew out the poison, and thus prevented it from developing in fatal form at some future time. I was therefore correct, Dr. Corbally notwithstanding, when I said that "they believed it necessary to dislodge the disease by inoculating with small-pox virus." I would refer the doctor, for information regarding China, to Samuel Wells Williams's book entitled "The Middle Kingdom," where I am certain he will find as much valuable information as he can obtain from an attaché of the French Legation. Those who know anything about the attachés of Legations are not likely to quote them as authority upon any important scientific subject. Besides, all that Morache refers to is the prevalence of small-pox disfigurement among the population of Peking. How could it well be otherwise, when the disease is communicated by inserting the dry small-pox scabs into the nose, thus making infection positive?

In regard to the discovery of vaccination, the doctor says: "The discovery belongs to him (Jenner) as the discovery of America belongs to Columbus." Does the doctor forget that in his article he tells us that "vaccination, the most efficient of all the preventive measures now known, was practised by the Hindoos for centuries, as is proved by the books on the subject; and cow-pox has been used from time immemorial by the nomad tribes of modern Persia"? Moreover, Jenner himself conceded that his attention had been first directed to the subject by hearing a milkmaid say that she could not take the small-pox because she had had cow-pox; and further inquiry proved that this was a popular belief among the farmers

of England. In 1774 Farmer Benjamin Jesty, then of Yetminster, in Dorset, inoculated with vaccine matter his wife and two sons, an account of which was published and had been investigated by many physicians long before Jenner's promulgation of the practice of vaccination. In fact, Jenner himself, in his correspondence with his friends, complained of the attempt made by his enemies to deprive him of the credit of his discovery; and in 1805 the Jennerian Society invited Mr. Jesty and his sons to visit that institution, which he did, and satisfactorily established his claim as the first inoculator of cow-pox. Therefore the statement of Dr. Corbally should be properly applied to Jesty, for he showed the way, and Jenner followed him as other discoverers followed Columbus to America. The further comparison between Jenner and Columbus made by Dr. Corbally is too frivolous to discuss, as no scientific searcher after truth has a right to assert, after seven years of observation, that "a person who has thus been affected is forever after secure from the infection of small-pox."

In regard to the slight differences in the quotations of percentages, which Dr. Corbally thinks so detrimental to my argument, I would say that they were taken from the percentages in different years, and related to different epidemics of small-pox; and even the lowest percentage quoted is more than sufficient to establish my position.

Again, when I state that my official statistics, quoted from the reports of the Registrar-General of England, have been ignored by Dr. Bell and Dr. Abbott, Dr. Corbally comes to their rescue in this sentence: "Certainly they ignore them if they are based on the supposition that 95 per cent of the people were vaccinated, and for the further reason that in 1871 small-pox was of unprecedented severity in all parts of the world." I am thankful to the doctor for this frank admission, for, leaving all percentages out of the question, why should small-pox be of unprecedented severity in the face of 73 years of vaccination and 18 years of compulsory vaccination? This one fact alone—which all vaccinators are forced to admit—conclusively demonstrates that vaccination did not have any effect in preventing the ravages of small-pox or decreasing the mortality due to that disease. As the doctor admits, the disease was unprecedentedly severe in all parts of

the world from 1871 to 1874, and more fatal than at any time in the century.

Dr. Corbally certainly does give due credit to the effects of sanitation in preventing small-pox, and thus his position differs materially from that taken by Dr. Bell ; for the latter, in concluding one of his arguments, says : " It shows conclusively that the saving of life from small-pox which has been effected has been by vaccination alone, and not by improved sanitation generally." Dr. Corbally agrees exactly with Dr. Lawson Tait in regard to the value of sanitation, and says so in so many words, even though he tells us that Dr. Bell " wishes it to be understood that he would as soon consult Dr. Gunn on a case of abdominal surgery as Lawson Tait of London on a question of vaccinology." Evidently the doctor is no more aware of Dr. Tait's knowledge of vaccinology than he is of Dr. Gunn's knowledge of abdominal surgery, and should he desire to look over my case book, I may be able to show him that his comparison is not well founded.

How strange it is that, no matter what the professional or scientific attainments of a man may be, no matter how he may have previously been honored, nor what positions of preferment and trust he may have occupied, the moment he says a word against vaccination he is denounced as not knowing anything of the subject, and not being an authority in medicine. Both Dr. Creighton and Dr. Crookshank have occupied foremost positions in the medical profession in England, have been connected with the leading hospitals and universities. Dr. Crookshank is still a professor in King's College, London, and is recognized as the highest authority in pathology and bacteriology.

If Dr. Corbally desires to know who are the consulting physicians to the Board of Health of Lowell, Mass., whom I quoted in my last article, he or any of the writers in *THE SANITARIAN* can obtain the report of such consulting physicians by sending a postal-card to Mr. Samuel Darling, 41 Wesleyan Avenue, Providence, R. I. If my quotation from that report was vague and general, it was because I could not make it more extended within the limited space assigned to me. It seems easy for Dr. Bell, Dr. S. W. Abbott, Dr. C. A. Siegfried, and Dr. Corbally to resort to ridicule when referring

to my statements and those of the eminent medical men from whom I quote ; but ridicule and attempts to belittle an opponent are not argument, and will fall to the ground when confronted by the strong array of scientific authorities who take my side in this controversy, after careful investigation of the entire subject in an impartial spirit. Space will only permit me to quote the names and words of a few men—men who can hardly be classed as ignorant or as having no professional standing.

The celebrated Dr. John Hunter, a contemporary of Jenner, says : “ The introduction by inoculation of mineral or vegetable poisons into the blood is hazardous, and, in certain quantities, may be destructive ; but the introduction of animal products from another living body, be it a man, a cow, or even an ass, is infinitely more pernicious, because allied to it in being vitalized.”

Dr. George Gregory, for fifty years Director of the Small-pox Hospital in London, says : “ The idea of extinguishing small-pox by vaccination is as absurd as chimerical, as irrational as arrogant.”

Dr. John Epps, twenty-five years Director of the Jennerian Institute, after vaccinating about 120,000 people, finally declared, in 1861 : “ The vaccine virus is a poison. As such it penetrates all organic systems, and infects them in such a way as to act repressively on the small-pox. It is neither antidote nor corrigent, nor does it neutralize the small-pox, but only paralyzes the expansive power of a good constitution, so that the disease has to fall back upon the mucous membrane. Nobody has the right to transplant such a mischievous poison compulsorily into the life of a child.”

Dr. Joseph Herrmann, Chief of the Imperial Wiede Hospital, Vienna, from 1858–64, says : “ When one has treated hundreds of cases of small-pox, both under sporadic and epidemic conditions, through many years and at all seasons, one comes to the decided conclusion that vaccination has not the remotest effect on the outbreak, course, or issue of the disease.”

The following is the opinion of Dr. Adolf Vogt, Professor of Medicine and Hygiene, Berne University : “ At all times and in all places the conditions and habits of life—in a word, the social position of the people in question, influences the spread and intensity of most diseases, and specially of small-pox ; and vaccination has no such influence.”

Mr. Brudenell Carter, F.R.C.S., says : “ It seems to me, however, that the positions alike of the public and of practitioners have been changed for the worse by that aggregate of

useless, meddlesome, and mischievous legislation known as the Vaccination Acts. . . . I think that a large proportion of cases of apparently inherited syphilis are in reality vaccinal."

Dr. H. Oidtmann, Staff Surgeon and Chief Physician to the hospitals at Verdun and St. Quentin during the Franco-German War, referring, in his report, to the enormous small-pox mortality in the French army as compared with the German, which he attributes to "the reliance on the infallible vaccinal protection and utter disregard of sanitation," adds, "shortly before the outbreak of the war, the whole of the French army were revaccinated. This general vaccination tended rather to extend the disease than to protect from it."

G. F. Kolb, of Munich, Member Extraordinary of the Royal Statistical Commission of Bavaria, and author of several statistical works of European reputation, writes as follows: "From childhood I have been trained to look upon the cow-pox as an absolute and unqualified protective. I have, from my earliest remembrance, believed in it more strongly than in any clerical tenet or ecclesiastical dogma. The numerous and acknowledged failures did not shake my faith. I attributed them either to the carelessness of the operator or the badness of the lymph. In course of time the question of vaccine compulsion came before the Reichstag, when a medical friend supplied me with a mass of pro-vaccination statistics, in his opinion conclusive and unanswerable. This awoke the statistician within me. On inspection I found the figures were delusive; and a closer examination left no shadow of doubt in my mind that the so-called statistical array of proof was a complete failure. My investigations were continued, but with a similar result. For instance, in the kingdom of Bavaria, into which the cow-pox was introduced in 1807, and where, for a long time, no one except the newly born escaped vaccination, there were, in the epidemic of 1871, no less than 30,742 cases of small-pox, of whom 29,429 had been vaccinated, as is shown in the documents of the State Department. When, with these stern proofs before us of the inability of vaccination to protect, we reflect upon the undeniable and fearful mischief which the operator so often inflicts upon his victims, the conclusion forces itself upon us that the State is not entitled either in justice or in reason to put in force an enactment so directly subversive of the great principle of personal right. In this matter State compulsion is, in my opinion, utterly unjustifiable."

Thomas Brett, M.D., of London, says: "After fifty years' experience, I arrived at the conclusion that vaccination was not only useless as a preventive, but dangerous. I decline the

risk of vaccination, and would not vaccinate my bitterest enemy."

The *Lancet* for January 21st, 1871, says: "From the early part of the century cases of small-pox after vaccination have been increasing, and now amount to four fifths of the cases."

Sir James Y. Simpson, M.D., said: "Small-pox can never be exterminated by vaccination."

Dr. Simon, Medical Officer of the Privy Council, England, says: "Small-pox after vaccination has been a disappointment both to the public and the medical profession."

Dr. James Rowell, formerly Health Officer of San Francisco, referred to the epidemic of 1868-69 thus: "Another marked peculiarity of this epidemic was the want of prophylaxy afforded by vaccination. . . . Those vaccinated or revaccinated since the commencement of the epidemic were apparently rendered thereby more susceptible to the disease."

Professor Felix von Niemeyer, in his work on the practice of medicine, says: "The remarkable fact that even at the present day extensive epidemics of small-pox occur in spite of most persons being vaccinated, or even in many cases revaccinated, once or oftener, has induced me to make some very careful observations regarding the protective power of vaccination."

All authorities now agree that syphilis may be communicated by humanized virus, the practice generally in vogue in England and most of the European countries. The advocates of bovine virus claim that it is free from this objection; but the London *Lancet* of June 22d, 1878, said:

"The notion that animal lymph would be free from chances of syphilitic contamination is so fallacious that we are surprised to see Dr. Martin (of Boston, U. S.) reproducing it."

Dr. Seaton, in his handbook of Vaccination, says: "So far from being likely to produce fewer ailments and cutaneous eruptions in the predisposed, Mr. Ceely—and there is no one who has nearly the knowledge that he possesses of the disease in the cow and of its transplantation to the human species—says he knows from his experience that it would produce more."

If time permitted I might make similar quotations from Dr. Copeland, author of the "Standard English Medical Dictionary;" Professor Joseph Jones, M.D., University of Nashville; J. Emery Coderre, Professor of Materia Medica, Victoria University, Canada; Dr. Jonathan Hutchinson, of England; Professor Hamernick, University of Prague; Professor Bock, of Leipsic; Professor De Paul, of Paris; Pro-

fessor Kranichfeld, of Berlin; Professor Hochstetter, of Espling; Professor Alexander Wilder, of New York; and many others eminent in the medical profession.

We might add to these the names of such scientists and statesmen as Professor Francis W. Newman, Professor Huxley, Herbert Spencer, W. E. Gladstone, John Bright, Earl Percy, Sir Wilfred Lawson, Alexander Von Humboldt, and the host of others who have either denounced vaccination *in toto*, or have signified their disapproval of any system of compulsory vaccination.

Any reader who desires to pursue this subject further will find all the facts and figures given consecutively and at length in a pamphlet by the writer, entitled "Vaccination: its Fallacies and Evils." As, at the suggestion of the editor of THE SANITARIAN, this article finishes my part of this discussion, in concluding I desire to thank the editor for his courtesy, and I trust that if I have not converted the readers to my way of thinking, I have at least not wearied them, and have succeeded in showing them that there are two sides to this question.

ROBERT A. GUNN, M.D.

EDITORIAL REPLY.

REFERENCE to the origin of this discussion and to some facts in regard to the manner in which it has been conducted will show that, while Dr. Gunn sought the discussion, he has studiously avoided the real question at issue.

The paper which he challenged was an article on the "Protective Power of Vaccination," written primarily as a review of Dr. Barry's able report of the epidemic of small-pox in Sheffield. With this was included a notice of Colin's report of the small-pox epidemic in Paris, and the cases treated in La Bicêtre during the siege. Extracts were made from an article by Dr. Goldschmidt, in which he gave a detailed account of vaccination as practised in the German Empire, and a reference to the "Merit H. Cash Prize Essay," by Dr. Bell.

A page of introduction was prefixed to that review, as it was not anticipated that it would form the subject of future criticism. That page contained no matter having any relation

whatever with "The Truth about Vaccination," yet that page is the only part on which Dr. Gunn has spent the whole force of *his* "scientific criticism." He has dealt at length with the Chinese and other Asiatics, the universality of small-pox, inoculation with small-pox virus, etc., to the entire exclusion of the subject which he proposed to discuss.

These statements are sustained by the following facts :

The article challenged was published in THE SANITARIAN for November, 1890. In a note dated December 6th following, Dr. R. A. Gunn asked the editor : " Will you give space in your pages to a presentation of the case against small-pox," etc. ?

In reply Dr. Bell made the following proposition : " THE SANITARIAN will be open to you for the *discussion* of, say, 'The Truth about Vaccination,' on the following conditions : First, that you publish Dr. Corbally's paper in the *Medical Tribune* as a *basis* of controversy."

On December 14th Dr. Gunn wrote : " I would say that I accept your terms for the discussion of 'The Truth about Vaccination.' "

Dr. Bell's terms will be best understood by reading Dr. Corbally's paper, beginning with the extract from Dr. Barry's report.

Dr. Gunn added : " The limit of four pages in which to answer a twelve-page article will compel me to confine my criticism to special points of the doctor's article."

THE SANITARIAN offered him *four pages monthly* for three months, instead of twelve pages for one month, which he asked. He has exceeded that amount, and the *sixth* article is above given, and the reader may judge of the use he has made of his year's work.

It will be noticed that he has limited his "special points" to the introduction on the first page of the article referred to.

In Dr. Bell's absence the reply to Dr. Gunn's No. V. devolved upon me, in order that the subject might be closed in the present volume. In that reply Dr. Gunn was reminded that he did not notice Barry, nor Colin, nor Goldschmidt.

In his immediately foregoing and concluding number he evades the question by saying that he "takes me to task for not devoting more time in this discussion to his [my] paper

entitled 'The Protective Power of Vaccination.''' He pleads limit of space, as if six articles, comprising thirty-one pages and nearly a year's work, were not sufficient in which to mention the authors reviewed in my article.

I would have taken no part in this discussion but for Dr. Bell's absence ; and I availed myself of the occasion to republish, in the November number, a part of the review on Dr. Barry's report, to enable me to call Dr. Gunn's attention to the fact that he did not reply to it. He ignores it again on the pitiful plea that he had not space. It was and is a matter of perfect indifference to me whether the paper was mentioned or completely ignored, but the facts in it about vaccination form what Dr. Gunn so grandiloquently proposed to annihilate by *his* "scientific criticism."

In the November article he follows the same method of chasing an *ignis fatuus*. By way of discussing vaccination he talks about a "logical play upon words." What is a "logical play upon words"? Has he allowed his opponent's criticism to draw him away from his subject? Shakespeare says : "To play upon words" is to give a fanciful turn to them. The doctor intends it, perhaps, for *ridentem dicere verum*, which would be very near the truth, so that the discussion is philosophical rather than vaccinological. The Chinese may have thought long ago that small-pox could be prevented by introducing small-pox virus into their noses ; but what has that to do with the truth about vaccination? The Chinese are now as eager for vaccination as most of the European nations.

No conclusion whatever was drawn from percentages ; but Dr. Gunn was reminded that he could not prove that 90 per cent of the people were vaccinated.

In addition to the facts then given, the following are taken from Dr. Goldschmidt's report, which Dr. Gunn forgot to mention :

"In 1885, of 1,374,436 children liable to be vaccinated, 144,469, or 10.51 per cent, were not vaccinated."

Why did not the able statistician and epidemiologist attack these figures rather than waste time on the Chinese, the antiquity of small-pox, Jenner, and Jesty, and the like?

Dr. Gunn need not be thankful to me for admissions. He distorts them and tries to turn them to his own account if he

can seize upon something in them irrelevant to the question. I have probably as much respect for Lawson Tait as Dr. Gunn. His endeavor to introduce personal feeling leads me to state that as I write there is before me a very fair engraving of Mr. Tait. Dr. Gunn praises him because he is said to be opposed to vaccination; I, because he is so justly distinguished as a surgeon and gynecologist.

As a logician Dr. Gunn will understand that it is not my place to write to his authorities.

Again he winces because ridicule is returned for ridicule. Crookshank sneers at cow-small-pox and other ridiculous epithets which Dr. Gunn quoted.

“Semper ego auditor tantum? Nunquamne reponam
Vexatus tolies rauci Theseïde Codri.”—(Juv. Sat. I.).

“Must I always be a hearer only? Shall I never retaliate, though plagued so often with the Theseïd of Codrus, *hoarse with reciting it.*”

Among the long list of statesmen, of philosophers, of earls, and scientists, I will refer only to one. Dr. Gunn says that Dr. H. Oidtmann, Staff Surgeon and Chief Physician to the hospitals at Verdun and St. Quintin during the Franco-German War, referring in his report to the enormous small-pox mortality in the French army, as compared with the German, which he attributes to the “reliance on the infallible (?) vaccinal protection and utter disregard of sanitation,” (?) adds, “shortly before the outbreak of the war the whole of the French army were vaccinated. This general vaccination tended rather to extend the disease than to protect from it.”

“Infallible vaccinal protection” is good. “Utter disregard of sanitation” is a slander. If it were true, as “chief physician, etc.,” he paints his own character.

Is this honest? Oidtmann knew, as other army surgeons knew, that “*shortly* before the outbreak of the war, the whole of the French army were *not* vaccinated. He also knew that during the war many thousands were killed or disabled, whose places had to be supplied by new recruits, most of whom were from remote provinces, and had never been vaccinated. He knew that in the condition of the country it was impossible to obtain vaccine lymph, and that the disease was most severe

among those recruits who were brought together in great numbers for drill and instruction. Oidtmann knew all this, and yet he makes these unfounded assertions.

Either Dr. Gunn did not read the article he proposed to refute, or he is disingenuous in ignoring the following, from page 391 of *THE SANITARIAN* for November, 1890 :

“ He—Dr. Goldschmidt—contrasts France with Germany, and states that Paris alone has more deaths from small-pox than the whole German Empire. Every year are found in different parts of France *foci* of epidemics which are fed solely by the unvaccinated.”

T. P. CORBALLY, M.D.

Dr. CORBALLY'S pungent reply to Dr. Gunn's fifth article, October number, leaves no room for Dr. Bell to regret his absence at that time. On the contrary, he is much gratified with the effort of Dr. Corbally to recall Dr. Gunn's attention to the subject at issue. But that, notwithstanding, and to the last, as shown by the foregoing article, Dr. Gunn has from the outset labored to shirk it, is doubtless due to the fact that the evidence in favor of the protective power of vaccination against small-pox is invincible.

Dr. Gunn had been known to us for several years as a champion of the anti-vaccinists before legislative committees, in opposition to measures for the protection of the public against small-pox. From his opportunity, as editor of the *Medical Tribune*, to make himself acquainted with the views of others of his own way of thinking, and the vigor with which he has opposed legislative measures for the protection of the public against small-pox by vaccination, it is reasonable to suppose that he is thoroughly familiar with the means and arguments of the anti-vaccinists generally. That those means and arguments mainly consist in an effort to obscure the truth by recalling the fallacies of a bygone age, and a total purblindness to the advances of preventive medicine, and against small-pox in particular during the last fifty years, is perfectly apparent.

Dr. Gunn being the proponent in this discussion, our effort has been to keep the issue before him, not by massing all the evidence available by any means—indeed, it would not be

possible to do that in the space of a whole volume of THE SANITARIAN—but by recalling his attention to evidence as opposed to mere opinion. In his painstaking citation of distinguished individuals—modern as well as ancient—opposed to vaccination, there is *not one* among them of any distinction as a practical health officer ; *not one* who has ever had to contend with an epidemic of small-pox with a view to its arrest ; *not one* who bases his knowledge upon the ascertained results of a small-pox attack on a vaccinated community as compared with an attack on one that has not been vaccinated.

Most of the *authors*—not authorities—and men of distinction Dr. Gunn has cited in support of his opinion are, like his “evidence,” foreign, as well as ancient. All of whom are sufficiently offset by the evidence of practical sanitarians, authentic statisticians, and governmental authorities referred to in our several replies, who are, for the most part, passed over by Dr. Gunn, or opposed by him because they are official, and he says on that account prejudiced. For the rest, and with special reference to the alleged danger of communicating other diseases with the vaccinia :

Among the distinguished authorities who gave evidence before the Royal Commission on Vaccination—before whom the “evidence” of Dr. Creighton, quoted in THE SANITARIAN for October, was elicited in 1889—was John H. Rauch, M.D., of Illinois, called upon, doubtless, because he is well known to have had larger experience in the premises than any other person in this country. After having explained to the Commission the various laws in the several States with reference to vaccination and the difficulties in the way of its universal practice, Dr. Rauch proceeded to give his experience as to general immunity from injury after vaccination, and stated, in substance, as the result of his experience, which commenced in 1861, that although he had personally vaccinated and had had under his immediate supervision about 250,000 people, he had never during that time seen a case of syphilis as the result of vaccination ; and he had never seen any one die as the result of the operation ; although cases of bad ulcers had at times come under his notice.

January, 1885, G. G. Craig, M.D., at that time Commissioner of Health of Rock Island, Ill., by authority of the

Common Council undertook to ascertain the opinions of all health officers in the different States and cities of 20,000 inhabitants and upward on the following questions :

“ 1. Is it advisable to rely wholly upon isolation and quarantine in the management of small-pox epidemics ?

“ 2. Do you believe that vaccination will protect an individual against an attack of small-pox ?

“ 3. To what extent have evil results followed vaccination in your experience ?

“ 4. Would the evil results sometimes charged to vaccination cause you to hesitate to recommend it in case of small-pox epidemics ?

“ 5. What is your opinion regarding the statements and statistics furnished by anti-vaccination societies ?”

He sent out one hundred and forty-five circulars, and up to the time of making up his report he received eighty-five replies, all of which were from practical health officers. Among the specially significant were the following :

“ CHICAGO, ILL.

“ 1. No epidemic of small-pox was ever suppressed by isolation and quarantine alone.

“ 2. I have never seen a case of small-pox follow a *recent* successful vaccination.

“ 3. Since 1880, 250,000 vaccinations have been done by the officers of this department. No evil results have been observed beyond an ulceration about sore following some local injury to sore, also an occasional abscess in arm-pit.

“ 4. No.

“ 5. Worthless.

“ *Remarks.*—Dr. Hall, Medical Inspector, North Division, vaccinated two children in a low German family against the wishes of the parents. The children were neglected, and quite ugly sores resulted from scratching, filth, etc. ; suit was commenced against Dr. Hall by parents, but never brought to trial. There was no cause for action.

“ OSCAR C. DE WOLF, M.D.,

“ *Commissioner of Health.*”

“ NEW ORLEANS, LA.

“ 1. These are powerful agents of protection, but should not be wholly relied upon.

“ 2. A vaccination exhibiting the constitutional evidences of infection will generally protect absolutely, with rare exceptions of varioloid.

“3. I am exceedingly careful in the selection of healthy virus, and have rarely observed ill effects; and even these were due to constitutional condition pre-existing in the child.

“4. By no means; nor would the bursting of a gun in the hands of a hunter cause me to discontinue the use of gun powder if necessary. . . .

“JOSEPH HOLT, M.D.,
“*President Louisiana State Board of Health.*”

In summing up the testimony, Dr. Craig says :

“You will notice that those who have had the most experience are the most positive in their recommendations of vaccination.

“Taking all this testimony as a whole, I arrive at the following conclusions: In the management of small-pox epidemics it is not advisable to rely wholly upon isolation, quarantine, cleanliness, disinfection, fumigation, or any or all means combined, exclusive of vaccination. These measures are valuable as adjuncts, but vaccination is our sheet anchor, upon which we must mainly rely.

“Recent vaccination, properly and thoroughly performed, will afford complete protection against an attack of small-pox. To ascertain whether or not it is thoroughly done, it is proper that the system should be tested by repeated vaccinations, with unquestionably good and active virus, every few years, or upon any threatened outbreak of small-pox. If it is not necessary, it will do no harm, as it will not even make a sore, and, as individuals vary in their susceptibility to the disease, no limit of time can be fixed with accuracy, as to when the operation should be repeated.

“Serious evil results need not follow vaccination, and do not with ordinary care. The ulcers which sometimes occur when bovine virus is used can be readily caused to heal by cleanliness, touching occasionally with a strong solution of nitrate of silver, and dressing with carbolized ointment, or, if inflammatory, with poultices.

“I think, however, and so suggested four years ago to the Secretary of the Illinois State Board of Health, that the propagation of vaccine should be under official supervision, for it is highly improper and unjust that vaccination should be held responsible for a result occasioned by the filthiness, greed, ignorance, or carelessness of the propagator. I think

every city and State should use its influence with Congress to accomplish this object, and I have no doubt but that general and united action would be successful.

“Should a small-pox epidemic prevail or threaten, vaccination is the only safety. Small-pox can be wiped out by vaccination just as surely and as effectually as you can put out a fire by removing the fuel. All cities should have ordinances giving to the health officers the power to treat an epidemic of this disease intelligently and with vigor. Vaccination should be compulsory in infected localities. The rights of the individual cease where those of the public begin.

“No man’s whim should be held as sacred as the life and property of his neighbor, and should he persist in his stubbornness upon such occasions, he makes a nuisance of himself, and should be treated as such.”

Clearly the communicating of other diseases with the vaccination is far less frequent than fatal poisoning by mistakes in dispensing medicine ; less frequent than deaths due to erroneous treatment, consequent on mistaken diagnosis by physicians. And it would be even less unreasonable to wholly renounce the practice of medicine because of the accidents to which it is liable and the quacks that infest it, than it would be to renounce vaccination by reason of the accidents to which it is liable, chiefly on account of incompetents.

A. N. BELL, M.D.

THE PROGRESS OF INFECTIOUS DISEASES AND DEATH RATES AT THE MOST RECENT DATES.

COMPILED BY HARRY KENT BELL, M.D.

ALABAMA.—*Mobile*, 31,076 : Total deaths for the month of September, 68, of which number 41 were colored, and 20 were under five years of age.

Annual death-rate per 1000, 25.44. From zymotic diseases, 18 deaths, and from consumption, 10.

CALIFORNIA.—*San Francisco*, 330,000 : In October there were 554 deaths, of which number 154 were under five years of age. The annual death-rate per 1000 was 20.04.

From zymotic diseases there were 103 deaths, and from consumption, 83.

DELAWARE.—*Wilmington*, 62,000 : In the month of October there were 91 deaths, of which number 37 were under five years of age. Annual death-rate per 1000, 17.61.

From zymotic diseases, 23 deaths, and from consumption, 9.

DISTRICT OF COLUMBIA, 250,000 : Reports for five weeks ending October 31st, 545 deaths, of which number 227 were colored. Annual death-rate per 1000, 22.65.

From zymotic diseases, 149 deaths ; from consumption, 64.

FLORIDA.—*Pensacola*, 15,000 : Reports for the month of October, 21 deaths—5 under five years of age.

Annual death-rate, 16.8 per 1000.

ILLINOIS.—*Chicago*, 1,200,000 : Deaths during the month of October, 1910—780 under five years of age. Death-rate, 15.92. From zymotic diseases, 542 ; consumption, 160.

LOUISIANA.—*New Orleans*, 254,000 : Reports for three weeks ending October 31st, 350 deaths, of which 123 were colored, and 87 were under five years of age. Annual death-rate, 24.32 per 1000.

Deaths from zymotic diseases, 48 ; from consumption, 58.

MARYLAND.—*Baltimore*, 455,427 : In October, total deaths, 828—an increase of 179, compared with the corresponding month of October, 1890. Of these, 644 were whites and 184 colored—a death-rate of 20.12 per 1000 for the former and 31.09 per 1000 for the latter. The death-rate per 1000 for the whole population was 21.84. 96 persons died from infectious diseases, and 76 from consumption. 352, or 42.51 per cent of the total deaths, were in children under five years of age.

There were 248 cases of infectious diseases reported—an increase of 69 over the preceding month.

MICHIGAN.—Meeting of the State Board. The members present at the meeting of the State Board of Health at Lansing, October 13th, 1891, were Professor Vaughan, Professor Fall, Dr. Gray, Mr. Wells, and Dr. Baker.

The Secretary presented letters from the mayor and others, and a numerously signed petition from citizens of Iron Mountain, setting forth that their city is suffering from a serious epidemic of typhoid-fever, 436 cases and 32 deaths from typhoid-fever having occurred from August 7th to October 6th, 1891, and asking that the State Board hold a sanitary convention there for the purpose of aiding the citizens in stamping out the epidemic, and stating that Iron Mountain had raised \$250 for defraying the expenses of such convention. Although petitions for conventions at Holland and at Charlotte had precedence of this one, on account of the very serious situation at Iron Mountain, the Board decided to accept the invitation and hold a convention there October 30th and 31st.

The Board also appointed a committee to investigate an outbreak of diphtheria at Imlay City and vicinity, from which upward of 70 cases and 14 deaths are reported to have occurred since August, 1890.

The Secretary presented a report of typhoid-fever in Deerfield township, where about 26 cases and 7 deaths have been reported since August 20th, 1891.

Correspondence relative to a suspected case of leprosy in Michigan was presented, and also the reported casualties from kerosene oil during the past quarter.

In his report of work done during the quarter, the Secretary mentioned that the Office had received notice of and taken action relative to 492 outbreaks of dangerous communicable diseases during the quarter, and 1120 letters had been written.

Dr. Baker stated that, although the statistics show that through health measures—chiefly isolation, disinfection, and vaccination—there has been recently a reduction of at least 1100 deaths per year in Michigan from the three diseases small-pox, scarlet-fever, and diphtheria, there still remained 7000 deaths per year from diseases known to be preventable through measures the knowledge of which is being spread by the State Board of Health. He thought that an increase of the same work which has contributed to cause the reduction would be the most profitable use to which the people of Michigan could put a few thousand dollars, and that a further re-

duction in the deaths can be made by the constant employment of more persons in health work, one or two of whom could be employed by the State to good advantage.

Professor Vaughan spoke of one line of work which seemed to be specially needed—an inspector to visit and aid localities to stop dangerous contagious diseases. Typhoid-fever and diphtheria are epidemic in places too numerous to be visited by members of this Board, who, if they go, must leave their own business to work for the public without compensation. Something is being done now, but more ought to be done than can be done by members of the Board.

For the month of October, 1891, compared with the preceding month, the reports indicate that pneumonia, pleuritis, tonsillitis, influenza, and inflammation of brain increased, and that measles, puerperal-fever, cholera infantum, cerebro-spinal meningitis, cholera morbus, and dysentery decreased in prevalence.

Compared with the average for the month of October in the five years 1886-90, cholera morbus, cholera infantum, dysentery, typhoid-fever, diarrhœa, and inflammation of bowels were more prevalent, and measles, membranous croup, puerperal-fever, typho-malarial-fever, erysipelas, diphtheria, and intermittent-fever were less prevalent in October, 1891.

Including reports by regular observers and others, diphtheria was reported present in the month of October, 1891, at eighty-two places; scarlet-fever, sixty-six; typhoid-fever, one hundred and forty-two; measles, nine, and small-pox, one place.

Reports from all sources show diphtheria reported at four places less; scarlet-fever, eighteen places less; typhoid-fever, sixteen places less; measles, thirteen places less, and small-pox, at one place less than in the preceding month.

MINNESOTA.—The Secretary of the State Board of Health reports for the month of September 782 deaths from all causes. The principal causes and number of deaths therefrom were: diarrhœal diseases of children, 146; tuberculosis, 70; diphtheria, 29; scarlatina, 9; enteric-fever, 62; pneumonia, 21.

Sixty-six per cent of all deaths from enteric-fever in September occurred in four cities of over 5000 inhabitants each, with

a combined population of 339,841—but 26.1 per cent of the total population of the State. (Minneapolis, 17 ; St. Paul, 12 ; Duluth, 10, and Mankato, 2.) Thirty-three per cent of the deaths from this cause were in cities of less than 5000 inhabitants, villages, and townships, in which live 70 per cent of the whole population. Of the 29 deaths by diphtheria during this month, 24 occurred in 9 cities containing but 29.49 per cent of the population of the State (Stillwater, 9 ; Minneapolis, 8 ; Duluth, 7 ; Winona, St. Cloud, Mankato, and Fairbault, but 1 each.) In villages and townships with 70 per cent of population there were but 4 deaths from this cause, and they in 3 townships.

NEW JERSEY.—*Hudson County*, 283,850 : The number of deaths during September was 607—314 under five years of age. Annual death-rate per 1000 was 25.7. From zymotic diseases, 162 deaths, and from consumption, 58.

Paterson, 78,358 : Reports 120 deaths during October, of which number 44 were under five years of age. From zymotic diseases, 23 deaths, and from consumption, 13.

NEW YORK.—*The Bulletin of the State Board* for the month of September, compared with the preceding month, shows a diminished infant and zymotic death-rate, the chief diminution being in diarrhœal diseases, from which cause there were about 1000 fewer deaths ; there was also a small diminution in scarlet-fever and measles. From malarial diseases there was a moderate increase ; typhoid-fever increased from 171 to 287 deaths, and diphtheria from 266 to 334 deaths. The number of deaths attributed to diseases of the nervous system is considerably less, and about one third fewer deaths occurred from accidents, chiefly drowning. The total number of reported deaths from all causes is 1000 less than in August. Compared with September, 1890, the total reported mortality is 1000 greater, the increase being, among local diseases, in deaths from diseases of the digestive and nervous systems, and from zymotic diseases there were about 4 per cent more deaths, the increase showing, relatively, in diarrhœal diseases, diphtheria, typhoid-fever, and scarlet-fever. Typhoid-fever epidemics have been reported from Auburn, Laurens, and

Russell, and a considerable prevalence is noted in localities in the maritime district and along the Mohawk Valley. Diphtheria has been unusually prevalent, epidemically, in numerous localities, and there were 100 more deaths in the State from this cause than one year ago. In thirty cities, with an aggregate population of 3,657,500, the average annual death-rate is 22.10 per 1000; 2.44 per cent of all deaths were from typhoid-fever, and 4.04 per cent from diphtheria. In forty-seven large villages, with 417,000 population, the death-rate is 19.80; the percentage of deaths from typhoid-fever is 4.90, and from diphtheria 2.74. Of 1886 deaths occurring in rural towns, not specified in the *Bulletin*, 3.92 per cent were from typhoid-fever, and 2.12 from diphtheria.

New York, 1,680,796: Total deaths, 3231—1529 under five years. Death-rate, 23.39. Zymotic diseases per 1000 deaths from all causes, 348.50. Deaths from consumption, 421.

Brooklyn, 862,155: Total deaths, 1608—840 under five years. Death-rate, 22.69. Zymotic diseases per 1000 deaths from all causes, 251.25. Deaths from consumption, 153.

Albany, 100,000: Total deaths, 153—49 under five years. Death-rate, 18.36. Zymotic diseases per 1000 deaths from all causes, 235.10. Deaths from consumption, 21.

Syracuse, 88,143: Total deaths, 135—54 under five years. Death-rate, 18.10. Deaths from zymotic diseases per 1000 deaths from all causes, 278.20. Deaths from consumption, 20.

Buffalo, 255,000: Total deaths, 511—255 under five years of age. Death-rate, 23.98. Deaths from zymotic diseases per 1000 deaths from all causes, 285.71. Deaths from consumption, 37.

Rochester, 138,327: Total deaths, 213—96 under five years of age. Death-rate, 18.41. Deaths from zymotic diseases per 1000 deaths from all causes, 220.66. Deaths from consumption, 19.

NORTH CAROLINA.—*The Bulletin of the State Board of Health* reports the following: In twelve towns, with 46,214 white and 38,512 colored inhabitants, there were during the month of September 37 deaths among the whites and 53 among the colored; the respective annual death-rates were 9.6 and 16.5. Deaths under five years of age numbered 49.

There were 11 deaths from diarrhoeal diseases, 11 from consumption, 8 from typhoid-fever, and 7 still-born.

Wilmington, 21,000 : Total deaths, 36—25 under five years of age. Annual death-rate, 20.6 per 1000.

Raleigh, 15,000 : Total deaths, 8—all under five years of age. Annual death-rate, 6.4 per 1000.

OHIO.—*The Monthly Sanitary Record* reports that in sixty-six cities and towns, with an aggregate population of 1,252,106, there were, during the month of September, 1713 deaths, of which number 608 were under five years of age. Deaths from zymotic diseases numbered 505, and from consumption, 163.

Cincinnati, 296,908 : Reports for September, 407 deaths—157 under five years of age. From zymotic diseases there were 84 deaths, and from consumption, 47. Annual death-rate per 1000, 16.44.

Columbus, 101,945 : Reports for September, 101 deaths—34 under five years of age. From zymotic diseases, 31 deaths, and from consumption, 19. Annual death-rate, 11.88 per 1000.

Toledo, 82,652 : Reports for September, 103 deaths—18 under five years of age. From zymotic diseases, 31 deaths, and from consumption, 7. Annual death-rate, 14.84 per 1000.

Mansfield, 15,000 : Reports for September, 18 deaths—5 under five years of age. From zymotic diseases, 3 deaths, and from consumption, 4. Annual death-rate, 14.4 per 1000.

PENNSYLVANIA.—*Philadelphia*, 1,069,264 : In the five weeks ending October 31st, there were 1951 deaths, of which 680 were under five years of age. Annual death-rate per 1000 18.96. From zymotic diseases there were 423 deaths, and from consumption, 261.

Pittsburg, 247,000 : Reports for four weeks ending October 31st, 459 deaths, of which number 221 were under five years of age. Annual death-rate, 19.32 per 1000. From zymotic diseases there were 137 deaths, and from consumption, 26.

LITERARY NOTICES AND NOTES.

SAUNDERS' QUESTION COMPENDS NO. 20: ESSENTIALS OF BACTERIOLOGY FOR THE USE OF STUDENTS AND PRACTITIONERS. By M. V. BALL, M.D., late Resident Physician, German Hospital, Philadelphia; Assistant in Microscopy, Niagara University, Buffalo, N. Y. 12mo, pp. 159, with seventy-seven illustrations. Price, \$1. Philadelphia: W. B. Saunders.

This should be a very welcome manual to all those for whom it is intended, giving, as it does, the gist of the most important subject that now engages the attention of medical practitioners, and without a knowledge of which no student should expect to pass the ordeal of the "green" room. It is almost too concise—that is to say, it scarcely contains enough of the subject, but this is measurably made up by the object lessons—the well-adjusted illustrations of instruments and how to handle them which pervades the text. This much, at least, is essential to the student and to all practitioners as an introduction to the field of labor which it opens up, and which may thereby be subsequently cultivated more successfully by the study of more elaborate works.

NO. 21: ESSENTIALS OF NERVOUS DISEASES AND INSANITY, FOR STUDENTS AND PRACTITIONERS. By JOHN C. SHAW, M.D., Professor of Diseases of the Mind and Nervous System, Long Island College Hospital Medical School; Consulting Neurologist to St. Catherine's Hospital and Long Island College Hospital; formerly Medical Superintendent King's County Insane Asylum. 12mo, pp. 194. With forty-eight original illustrations. Price, \$1. Philadelphia: W. B. Saunders.

"This little book," the author says, in introducing it, "is not intended to take the place of the larger and more complete works of Ross and Gowers, but to be used somewhat as a primer for advanced students." Yet those who may read it, like those who may know of the author's thorough com-

mand of the subject from other sources of knowledge, will not fail to profit by the terseness of this author to such a degree as to render the more elaborate works referred to secondary to the primary knowledge which this little volume comprises, essential to all medical practitioners at the outset of their career. The illustrations are singularly lucid as means of diagnosis, and make the nearest possible approach to clinical instruction.

ARTIFICIAL ANÆSTHESIA AND ANÆSTHETICS. By DE FOREST WILLARD, R.M., M.D., Ph.D., Clinical Professor of Orthopædic Surgery in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, etc., and LEWIS H. ADLER, JR., M.D., Instructor in Rectal Diseases, Philadelphia Polyclinic and College for Graduates in Medicine. 12mo, pp. 144. Paper. Physicians' Leisure Library Series. Price, 25 cents per copy. Detroit: George S. Davis.

An excellent *résumé* of the uses, abuses, and dangers of anæsthetics, based upon considerable clinical experience and extensive study and analysis of testimony from the most authentic sources.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS, October number, 1891, contains five essays of interest to all medical practitioners, as follows: Treatment of the Diseases of Women, by Thure Brandt; Modern Treatment of the Morphine Habit, by Dr. A. Fromme; Contribution to the Study of so-called Scarlatina Puerperalis, by Professor Dr. Renvers; Influence of Alcohol upon the Organism of the Child—a Pharmacological-Clinical Study, by Professor R. Demme; Diseases of Development, by Dr. J. Comby. Monthly: \$10 a year; \$1 a number. William Wood & Co. New York.

AN ABSTRACT OF THE SYMPTOMS, WITH THE LATEST DIETETIC AND MEDICAL TREATMENT OF VARIOUS DISEASED CONDITIONS is a concise statement of the preparations and qualities of the refined food preparations manufactured by Reed & Carnrick. It is of practical utility to all physicians who would have a just appreciation of such preparations and their adaptation to digestion and assimilation, based upon physiological knowledge.

TEXAS SANITARIAN, Vol. I., No. 1, November, 1891, is an auspicious beginning of the latest addition to periodical literature, devoted to sanitation *pure and simple*, according to the prospectus and the excellent table of contents of this first number. We emphasize this condition because of the trade-journalism aspect of so large a proportion of the periodicals professedly devoted to the subject. It asks support under the promise that :

“ Every cause of disease, every subject embraced under the head of *Hygiene* will be discussed ; and special attention will be given to the importance of personal hygiene and physical culture ; also to the study of the effects of alcohol upon the human economy, and its agency in the production of moral, physical, and intellectual degeneracy.”

It claims the special advantage of being published at the capital of the State, the headquarters of the Health Department, and the special favor of the State Health Officer, who is one of the associate editors, and contributes to this number.

If it holds out as it has begun, it will doubtless secure, as it deserves, not only the support of the votaries of sanitation in Texas, but largely throughout the country.

PAMPHLETS, REPRINTS, REPORTS, ETC., RECEIVED.

Catalogue of the Michigan Mining School. Houghton, Mich.

Modern Methods of Wound Treatment. Johnson & Johnson, New York.

Tumors of the Naso-Pharynx, Pharynx, Larynx, and Œsophagus. W. Cheatham, M.D., Louisville, Ky.

Trap Siphonages and Trap-seal Protection. Professor J. E. Denton, Hoboken, N. J.

Translumination of the Antrum of Highmore, Nasal Cavities, Frontal Sinuses and Larynx, with Remarks on the Treatment, etc. Wendell C. Phillips, M.D., New York.

Institution for Consumptives. C. C. Fite, M.D., New York.

Extra-Peritoneal Treatment of the Stump in Abdominal Hysteriotomy for Fibroids. A. Lapthorne Smith, M.D., Montreal, Canada.

INDEX.

- Abbot, A. C., M.D., Corrosive Sublimate as a Disinfectant, 15.
- Actinomycosis, Crookshank, *et al.*, 543.
- Agas, Relative, of Husband and Wife, Karosi, 541.
- Alcohol, Use and Abuse of, Duckworth, *et al.*, 533.
- Alcoholism and Heredity, D'Armand, 202.
- Altitude, High, Influence of, upon Hereditary Tuberculosis, Moore, 442.
- ASSOCIATIONS, CONVENTIONS, ETC. :
 American Climatological Association, 92, 343 ; American Electro-Therapeutic Association, 192 ; American Medical Temperance Association, 87 ; American Public Health Association, 94, 480, 481, 500, 513 ; American Public Health Association, Address of Welcome, Francis Humphrey Peak, 500 ; American Medical Association, Membership in, 287 ; International Continental American Medical Congress, 192 ; International Congress of Hygiene and Dermography, 280, 334, 447, 531 ; Mississippi Valley Medical Association, 287.
- Animals, Poisoned, The Use of the Flesh of, 162.
- Antikamnia, 363.
- Antikamnia as an Antipyretic, 167.
- Aquarium Cement, 379.
- Aristol in the Treatment of Pulmonary Tuberculosis, 475.
- "Arno, The," 86.
- Atmospheric Pollution—Germs and Their Culture, 97.
- Bath, The Bell, 514.
- Being Dead, Yet Giveth, 34.
- Bell, A. N., A.M., M.D., Ocean Atmosphere, 478 ; The Bath, 514 ; The Beneficence of Disease, 193 ; The Truth about Vaccination, 328, 548.
- Bell, H. K., M.D., The Progress of Infectious Diseases, 70, 168, 261, 364, 469, 563.
- Bosworth, F. H., M.D., Lymphotism, 351.
- Bread Making, Science in, 358.
- Bryce, P. H., M.D., Present Position of the Milk-Supply Problem, 509.
- Bug, Chinch, Snow, 510.
- Cane Disease, 259.
- Cars, Passenger, Hygienic Condition of, 129.
- Catarrhal Inflammations of the Upper Air Tract, General *versus* Local Treatment of, Robinson, 344.
- Cement for Glass, 167.
- Cerebral Hemorrhage, Etiology of, 164.
- Chancellor, C. W., M.D., Simple Methods of Sewage Disposal Illustrated, 289.
- Children and the State, Mitchell, *et al.*, 536.
- Cholera, 268.
- Cholera Report, Dr. Shakespear's, 374.
- Clarke, E., M.D., Disposal of Waste and Garbage, 505.
- Climate of the Greater Piedmont and the Mountainous Regions of the South, Van Bibber, 348.
- Coca, Erythroxyton, De Pietra Santa, 38.
- Compliment, An Unsolicited, 236.
- Conn, G. P., M.D., Hygienic Condition of Passenger Cars, 129.
- Corbally, Infectious Diseases Abroad, 268 ; Medical Excerpt, 65, 162, 256, 358 ; The Truth about Vaccination, *et al.*, 458, 541.
- Craig, J. D., A.M., M.D., Epidemic Diseases in Albany and Vicinity, 212.
- Croton Valley Watershed, 272.
- Curtin, R. G., M.D., Epidemiology of Influenza and its Relations to Catarrhal Fever, 433.
- D'Armand, J. A., M.D., Alcoholism and Heredity, 202.
- Dead, The Disposal of, Thompson and Haden, 532.
- De Pietra Santa, P., M.D., Erythroxyton Coca, 38.
- Dietary Scales in Connection with the Health of Seamen, Scurvy, Spooner, Rae, Collingridge, Levanson, 457.
- Diphtheria at High Altitudes, Jayne, 439.
- Diphtheria, The Etiology of, Contribution to, Kline, 102.
- Diphtheria, Seaton, Schrebens, Hewitt, Abbott, Paget, Thursfield, Tripe, and Others, 447.
- Disease, The Beneficence of, Bell, 193.
- Disinfectant, a, Corrosive Sublimate as, Abbot, 15.
- Disinfectant, a, Eucalyptus as, 280.
- Disinfectants, Testing, Gruber, 542.
- Disinfection of Excreta, Sternberg, 302.
- Disinfection of the Living Body, Behring, 541.

- Distilled Spirits, Collections from, 239.
 Drainage of the City of Mexico, Gayol, 504.
 Drainage, Underground, Sanitary and Unsanitary Relations of, Bryce, 240.
 Duckworth, Sir Dice, *et al.*, Use and Abuse of Alcohol, 533.
 Education, Medical, Higher Hygienic, 125.
 Education of the Blind, Campbell, 546.
 Emigrants, Existing Method of Dealing with, Hewitt, 512.
 Empyema, Acute and Chronic, Surgical Treatment of, Richardson, 350.
 Enteric-Fever, Squire, *et al.*, 537.
 Epidemic Diseases in Albany and Vicinity, Craig, 212.
 Epileptic and Feeble-Minded Children, Care and Treatment of, Beach, *et al.*
 Euophen, 362.
 Eucalyptus as a Disinfectant, 280.
 Examination for Junior Assistant Physician in New York State Hospitals, 96.
 Excess, The Restraining Mercy of, Wood, 376.
 Excreta, The Disinfection of, Sternberg, 302.
 Face Bleach, Madame A. Rupert's, 370.
 Fall, D., Prof., Disposal of Waste and Garbage, 505.
 Fireproof Buildings, 135.
 Flick, L. F., M.D., Duty of the Government in the prevention of Tuberculosis, 316.
 Foot, The Normal Form of, 477.
 Foot, the, Sole of, Variation in the Form of, 66.
 Fracture of the Clavicle, 362.
 French Birth-Rate and Depopulation, 372.
 Garbage, Disposal of Waste and, Fall, Clarke, Morse, 505.
 Gayol, R., C.E., Drainage of the City of Mexico, 504.
 Germs and their Culture, 97.
 Geddings, W. H., M.D., History of Leprosy on the Eastern Coast of the United States, 443.
 Glanders in Man, Sharp, 499.
 Grease Can be Taken out of White Marble, 477.
 Gunn, R. A., M.D., The Truth about Vaccination, 324, 458, 548.
 Gymnastic Exercise in Chest Diseases, Otis, 346.
 Haines, Reuben, The Ammonia Process of Water Analysis, 311.
 Health, Supreme Board of, of Mexico, Orvananos, 508.
 Hernia, Inguinal, The Radical Cure of, 67.
 Hernia, Non-Strangulated, Radical Cure of, 358.
 Hewitt, C. N., M.D., Existing Methods of Dealing with Emigrants, 512.
 Histero-Traumatism, 163.
 Homes of the Working Classes, The State Control in Reference to, Ravenstein, *et al.*,
 Horton, A. H., Necessity of Legislation against Quackery, 499.
 House, The Little, M. M., 118.
 Hygiene and Dermography, International Congress of, 531.
 Hygiene, Higher Medical Education, 125.
 Hygiene, Meteorology in Reference to, Buchan, *et al.*, 546.
 Hygiene of Rice Culture, Lomas, 511.
 Hygiene, Public, Progress of, Ycaza, 511.
 Hygiene, Value of, to Women, Schofield, 456.
 Immigrants, 379.
 Immunity, Ruffer, 542.
 Immunity, Roux, Buchner, Hankin, Emmerich, Adami, Klein, Metschnikoff and Wood, 449.
 Infant Mortality, McDonald, 498.
 Influenza, Epidemiology of, and its Relations to Catarrhal Fever, Curtin, Watson, 433.
 Inoculation, Preventive Practical Value of, Roux,
 Infection of Meat and Milk, Vaughan, Blanchard, Brown, Fleming, 455.
 Infectious Diseases Abroad, Corbally, 268.
 Infectious Diseases and Death Rates, The Progress of, Bell, 70, 168, 261, 364, 469, 563.
 Infectious Diseases, Notification of, 547.
 Infectious Udder, Diseases of the Cow in Relation to Epidemic Diseases in the Human Subject, Klein, *et al.*, 454.
 Insurance without Medical Examination, 123.
 International Continental American Medical Congress, 192.
 International Congress of Hygiene and Dermography, 280, 334.
 Jayne, W. A., M.D., Diphtheria at High Altitudes, 439.
 Jew Question, The, 286.
 Karosi, J., M.D., Relative Ages of Husband and Wife, 541.
 Kinyoun, J. J., M.D., U. S. M. H. S., Rabies, 507.

- Kline, E., M.D., F.R.S., Contributions to the Etiology of Diphtheria, 102.
- Koch's Lymph, Effects of, 66.
- Koch's Method, Ehrlich, *et al.*, 535.
- Koch's Remedy, The Value of, Smith, 357.
- Lacto-Cereal Food, 69, 260.
- Larynx, The, Tolerance of Foreign Body in, 69.
- Leprosy, History of, on the Eastern Coast of the United States, Geddings, 443.
- Life, Duration of, 110.
- Listerine, 260.
- LITERARY NOTICES :
- Annual of the Universal Medical Sciences, 380 ; Annual Report of Factory Inspectors of New York, 181 ; Artificial Anæsthesia and Anæsthetics (Willard), 571 ; Bacteriological World, 286 ; Century, 91, 187, 189 ; Climatologist, 284 ; Coal Dust Explosions, Preventing, 190 ; Cosmopolitan, 91 ; Demorest's Family Magazine, 382 ; Dictionary of the English Language (Funk and Wagnall's), 185 ; Dietetic and Medical Treatment of Various Diseased Conditions, 571 ; Essentials of Bacteriology (Ball), 570 ; Essentials of Nervous Diseases (Shaw), 570 ; Fundamental Problems (Carus), 88 ; Harper's Magazine, 91, 189 ; Harper's Weekly, 188 ; Home Journal, 188 ; Index Catalogue Library of Surgeon General's Office, U. S. A., Vol. XII., 380 ; Intestinal Surgery (Robinson), 183, 283 ; Journal of Balneology and Dietary, 285 ; Living Age, 186 ; Medical Diagnosis (Sierardt-Stuart), 182 ; Medical Register, N. Y., N. J., and Conn., 184 ; Mental Suggestion (Ocharowicz), 281 ; Metal Worker Essays, 381 ; New England Medical Journal, 283 ; New Era in Russia (De Armand), 89 ; Open Court, 287 ; Popular Science Monthly, 90, 186 ; Post-Graduate Course of Lectures, 286 ; Potable Water (Davis), 89 ; Proceedings of Conn. State Medical Society, 384 ; Public Baths (Baruch), 90 ; Pulmonary Consumption a Nervous Disease (Mays), 382 ; Representation of the Mean Yearly Temperature of a Place as a Function of its Geographical Longitude and Latitude (Schoch), 186 ; Sea-Sickness (Dutton), 282 ; Socialism (Mill), 185 ; Tables for Doctor and Druggist (Long), 383 ; Texas Sanitarian, 572 ; Transactions, N. Y. State Medical Society, 384 ; Tumors (Hamilton), 88 ; Vacation Time (Drayton), 184 ; Ventilation and Impure Air (Remondino), 183 ; Vis-Medicatrix, 285 ; What to Eat and How to Serve it (Herrick), 381 ; Wood's Medical and Surgical Monographs, 89, 184, 283, 383 ; 571.
- Lomas, N., M.D., Hygiene of Rice Culture, 511.
- Longevity, Homans, 3.
- Longevity of Actors, 111.
- Loomis, A. L., M.D., Histological Changes which Take Place in the Lungs in Cured Phthisis, 352.
- Lymphotism, Bosworth, 351.
- Magnesia, 260.
- McDonald, C. D., M.D., Infant Mortality, 498.
- Meat, Infection of, Vacher, 536.
- Medals, Jetons and Tokens Illustrative of Sanitation, Storer, 48, 142, 244.
- Medical Excerpt, Corbally, 65, 162, 256, 358.
- Medical Officers of Passenger Steamships, 237.
- Medical Practice in Connecticut, 288.
- Medical Training for Business, 378.
- Mesenteric Cysts, 65.
- Meteorology in Relation to Hygiene, Buchan *et al.*, 546.
- Micro-organisms, Effect of Ventilation on, 109.
- Milk-Supply Problems, Bryce, 509.
- Money, How to Save, 117.
- Montizambert, F., M.D., F.R.C.S., Address, Am. P. H. Assn., 481.
- Moore, H. B., M. D., Influence of High Altitudes upon Hereditary Tuberculosis, 442.
- Morse, W. F., Col., Disposal of Waste and Garbage, 505.
- Mortality Statistics Abroad, 79.
- Nitrate of Silver Stains, 288.
- Newtown Creek Nuisance, 278.
- OBITUARY :
- Garnett, A. Y. P., M.D., 34.
- Ocean Atmosphere, Bell, 478.
- Orvananas, D., M.D., The Supreme Board of Health of Mexico, 508.
- Otis, E. O., M.D., Gymnastic Exercise in Chest Disease, 346.
- Pancrobinin, 69.
- Paquin, P., M.D., D. V. S., Vaccine and Vaccination, 504.
- PERSONAL :
- Rubner, Max, M.D., 379.
- Wyman, Walter, M.D., Surg. Gen. U. S. M. H. S., 178.
- Fig. the, Development of, 137.
- Phthisis, Cured, Histological Changes

- which Take Place in the Lungs in, Loomis, 352.
- Phthisis, Pulmonary, Detrimental Effects of Over-Exertion in, Von Ruch, 17.
- Phthisis, Pulmonary, The Sputum in, Shurley, 349. ‡
- Phthisis, Specifics for, Attempts to Discover, Williams, 356.
- Physical Condition of Children in Schools, 547.
- Plaster, Hardening, 37.
- Pleurésies Métapneumoniques, 162.
- Practitioners, Incompetent—Iowa and Georgia, 378.
- Pre-tubercular Conditions, Tyndale, 440.
- Quackery, Necessity of Legislation against, Horton, 449.
- Quarantine, The N. Y., and Improvements in, 81.
- Rabies, Kenyoun, 507.
- Ransom, C. C., M.D., Waters of Richfield Springs, 441.
- Reform, Needed, 127.
- Rice Culture, Hygiene of, Lomas, 511.
- Richardson, M., M.D., The Surgical Treatment of Empyema, 350.
- Robinson, B., M.D., General *versus* Local Treatment of Catarrh, 344.
- Robinson, W. D., M.D., Tuberculosis in the Criminal Class, 29.
- Ruffer, A., M.D., Immunity, 542.
- Rutherford, R. C., Woollen or Linen, 385.
- Sanitary and Unsanitary Relations of Underground Drainage, Bryce, 240.
- Sanitary Service, Qualifications for, 235.
- Sanitary Situation in France, 80.
- Sanitation, Car, Daniells, 511.
- Sanitation, Medals, Jetons and Tokens Illustration of, Storer, 48, 142, 244.
- Sanitation, School, 179.
- School Hygiene, Burgerstein and Brosman, 456.
- School Sanitation, 179.
- Sewage, Chemical Treatment of Thresh and Carpenter, 456.
- Sewage Disposal, 289.
- Sharp, J., M.D., Glanders in Man, 499.
- Shurley, E. L., M.D., The Sputum in Pulmonary Phthisis, 349.
- Small-Pox Abroad, 80, 271.
- Smith, F. F., M.D., Value of Koch's Remedy, 357.
- Snow, F. H., Chinch Bugs, 510.
- Stearer, J. W., M.D., Tobacco and Physical Health, 211.
- Sternberg, G. M., M.D., U. S. A., Disinfection of Excreta, 302.
- Storer, H. R., M.D., Medals, Jetons and Tokens Illustrative of Sanitation, 48, 142, 244.
- Thompson's Sir Henry, Disposal of the Dead, 532.
- Thompson's Disease, 164.
- Thyroid, Metastatic Inflammation of the, 68.
- Tobacco and Physical Health, Stearer, 211.
- Tubercle, Accidental Inoculations with, 259.
- Tuberculosis, Sanderson, *et al.*, 534.
- Tuberculosis, Hereditary, Influence of High Altitudes upon, Moore, 442.
- Tuberculosis in the Criminal Class, Robinson, 29.
- Tuberculosis, Medical Congress on, 259.
- Tuberculosis, The Prevention of, Duty of the Government in, Flick, 316.
- Typhoid-Fever, 271.
- Tyndale, J. H., M.D., Pre-Tubercular Conditions, 440.
- Vaccination, The Royal Commission on, 42.
- Vaccination, The Truth about, Gunn, Bell and Corbally, 324, 458, 548.
- Vaccination, the Value of, An Early Proof of, 468.
- Vaccination, Vaccine and, Paquin, 504.
- Vaccine and Vaccination, Paquin, 504.
- Vacher, F., M.D., Inspection of Meat, 536.
- Van Bibber, W. C., M.D., Climate of the Greater Piedmont and the Mountainous Regions of the South, 348.
- Venereal Diseases, Prevention of, 547.
- Ventilation, Effects of, on Micro-organisms, 109.
- Vivisection, Worse than, 376.
- Von Ruch, K., M.D., The Detrimental Effects of Over-Exertion in Pulmonary Phthisis, 17.
- Wallace, A. R., LL.D., D.C.L., F.R.S., and the Royal Commission on Vaccination, 42.
- Waste and Garbage, Disposal of, Fall *et al.*, 505.
- Water Analysis, Haines, 311.
- Water Supply, Contaminated, Frankland, 537.
- Waters of Richfield Springs, Ransom, 441.
- Watson, E. W., M.D., Epidemiology of Influenza, 433.
- Williams, H. F., M.D., Attempts to Discover Specifics for Phthisis, 356.
- Wood, T. P., M.D., The Restraining Mercy of Excess, 376.
- Wool *versus* Linen, 179.
- Woollen or Linen, Rutherford, 385.
- Yeaza, J. R., M.D., Progress of Public Hygiene, 511.

